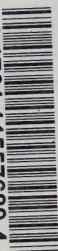


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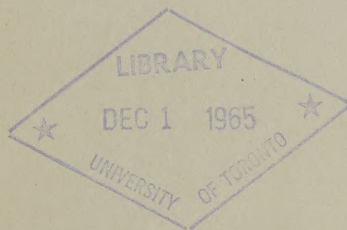
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GOVERNMENT ACTIVITIES IN THE NORTH

1964



ADVISORY COMMITTEE ON NORTHERN DEVELOPMENT

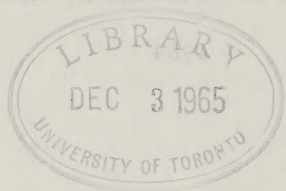
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GOVERNMENT ACTIVITIES IN THE NORTH



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Laboratory Committee on Northern Development
Department of Northern Affairs and Northern Development
Ottawa, Ontario

October 1965

GOVERNMENT ACTIVITIES IN THE NORTH - 1964

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ADVISORY COMMITTEE ON NORTHERN DEVELOPMENT

Responsibilities To advise the government on questions of policy relating to civilian and military undertakings in Northern Canada and to provide for the effective co-ordination of all government activities in that area.

Review of 1964 Operations

Reports were made to the Committee on a variety of matters affecting government policy in the north. Following the recommendation of the Committee, the construction program at Frobisher was cancelled and the role of Fort Churchill redefined. The program of grants to assist northern research institutes was expanded. The membership of the committee was:

The Deputy Minister of Northern Affairs and National Resources
(Chairman)

The Secretary to the Cabinet

The Under-Secretary of State for External Affairs

The Deputy Minister of Transport

The Deputy Minister of Finance

The Deputy Minister of Mines and Technical Surveys

The Chairman, Canadian Section, Permanent Joint Board on Defence

The Chairman, Chiefs of Staff

The Commissioner, Royal Canadian Mounted Police

The President, National Research Council

The Deputy Minister of Public Works

The Deputy Minister of Citizenship and Immigration

The Deputy Minister of National Health

The Deputy Minister of Defence Production

The Deputy Minister of Agriculture

The Deputy Minister of Fisheries

The Chairman, Defence Research Board

The Secretary, Advisory Committee on Northern Development.

To advise the government on questions of policy relating to northern and northern development in Northern Canada and to provide for the effective co-ordination of all government activities in that area.

Responsibilities

Review of 1964 Operations

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DEPARTMENT OF AGRICULTURE

Responsibilities Investigations of the agricultural potential in Northern Canada; research to determine the possibilities of gardening and farming; advice to other government agencies on matters related to agriculture in the Yukon and Northwest Territories, and other northern areas; botanical and ecological surveys as required; study of the biology, distribution, and systematics of northern insects, plant diseases, and soils.

Long-term Plans

Continuation of agricultural research on the Experimental Farms at Fort Vermilion, Fort Simpson, Inuvik, Mile 1019, and Fort Chimo; appraisal of agricultural potential in the North on the basis of soil surveys and surveys of native vegetation; collecting insects, fungi, and plants; agro-climatic studies on a continuous basis at most centres; providing agricultural data for an overall study of the natural resources of the North.

Review of 1964 Operations

Experimental work was continued on field and garden crops, beef cattle, and poultry at Mile 1019, Alaska Highway. Experiments included the production of cereal crops under various rotations and fertilizers and the production of certain vegetables and flowers using plastic shelters and mulches. Crops such as tomatoes, corn, peppers, beans, celery, etc., can be grown to maturity under cheaply constructed crop shelters. Tests with various forages, and carrying capacity studies of native and seeded pastures were continued. Work was begun to determine the feed consumption of beef cattle during the winter months in the new cattle barn and in the open feed lot constructed for this purpose.

At Fort Simpson experiments were continued with field and garden crops in relation to the climatic and soil conditions on the alluvial soil on the island and on the brown and grey-wooded soils on the mainland along the Liard River.

A limited number of vegetables were again tested at Inuvik where the permafrost is still receding with the use of the open areas for gardens. Using some commercial fertilizers alone or in combination with polyethylene mulches it was possible to grow most of the more common vegetables. Climatic data were collected and correlated with plant growth in this area.

At False River, near Fort Chimo, work was continued on alluvial soils over permafrost. Some vegetables were grown successfully in plastic-covered greenhouses, cold frames, and crop shelters, under plastic mulches, and in the open garden. Cereal crops failed to mature but good yields of green forage from cereals appeared a possibility. Cultivated grasses and legumes are not too well adapted in this area.

Two projects on northern soils have been completed with the publication of papers dealing with the characteristics of permafrost soils in the Mackenzie Valley and the Hazen Lake area. Reports and maps are nearing completion on the reconnaissance soils surveys of the Liard River Valley and the Hay River-Yellowknife Highway.

Botanical collections planned for Lake Hazen and at Melville Island were cancelled owing to weather, but an entomological survey party had a very successful season at the Hazen Camp Study Area in collaboration with the Defence Research Board. Several papers were published entitled "Studies on Arctic Insects".

Plans for 1965

Agricultural research work will be continued at Mile 1019, Fort Simpson, Inuvik, Fort Chimo, and Fort Vermilion. Special studies will be undertaken using additional equipment to record the micro-climate at Mile 1019.

Entomological investigations will be continued at the Hazen Camp, Ellesmere Island. Entomological studies will be combined with botanical and ecological surveys on Melville Island.

Plans are in preparation to study the Slave River Lowlands as to potential and feasibility for grazing. This will involve a soil specialist, a grazing expert, and possibly a botanist along with considerable help from forestry management personnel.

AIR TRANSPORT BOARD

Responsibilities The licensing of air carriers to operate commercial air services; the economic regulation of air carriers; investigations and surveys relating to the operation and development of commercial air services in Canada; advising the Minister of Transport on matters relating to civil aviation.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1964 Operations

The fixed wing airlift requirement for the vertical resupply of the DEW Line ex Winnipeg and Churchill for the period July 1, 1964 to June 30, 1965 was awarded by MATS, USAF, to TransAir Ltd. of Winnipeg, and the fixed wing airlift requirement for the lateral resupply of the DEW Line for the same period was awarded to Nordair Ltd., Dorval, P. Q. The Board approved both contracts. The air transportation requirements of the USAF for the ADC (Gap-Pine) sites in Labrador and on Resolution Island, N. W. T., for the period July 1, 1964 to June 30, 1965 are being provided under contracts with MATS and in accordance with filed tariffs by Wheeler Airlines (1960) Ltd., Okanagan Helicopters Ltd., and Eastern Provincial Airways (1963) Ltd. Supervision and coordination of these contractual arrangements continue and liaison has also been provided concerning Mid Canada Line requirements.

The Board has continued to deal with applications for additional air services in the North and to provide information on their availability.

Plans for 1965

Normal planning to meet responsibilities.

CANADIAN BROADCASTING CORPORATION

Responsibilities To provide a radio broadcasting service to the people of the north and to broadcast programs about the north on its radio and television networks.

Long-term Plans

To improve the present service on community stations, particularly by providing more programs in the local Indian and Eskimo languages; and to provide an adequate shortwave service to the north in English, French, and Eskimo.

Review of 1964 Operations

On March 26, an LPRT (low-power relay transmitter) was established at Teslin, completing present plans for a radio network covering the Yukon Territory.

Plans were developed for a directional antenna array for the north at the shortwave station at Sackville, New Brunswick. When completed, it is expected to improve the shortwave signal in the north considerably.

During the summer, the English radio network was extended to Goose Bay (CBC station CFGB); a combined French and English network service to Schefferville (Iron Ore Company of Canada's station CFKL) and to CBC automatic repeater stations at Labrador City and Wabush; and the French network to a CBC repeater station at Gagnon.

In addition to the network service, local broadcasts (chiefly news and weather reports) were provided to Schefferville and Labrador City/Wabush by station CFGB Goose Bay.

A representative committee of the Board of Directors toured the Eastern Arctic, Northern Quebec, and Labrador during the summer.

Events covered in the north were the tour of the Minister of Northern Affairs and National Resources and a group of distinguished guests in August, sessions of the Northwest Territories Council in Frobisher, and of the Yukon Territorial Council in Whitehorse, both in November. Special coverage was given to the Arctic and Sub-Arctic sessions of the American Association for the Advancement of Science at its annual meeting in Montreal in December.

Other Activities

The final report and drawings for the new residential community of Hay River were submitted to the Department of Northern Affairs and National Resources in May, completing the Corporation's relocation plan for the town.

In December, the Corporation was requested to review the proposals for a new commercial centre in the Pine Point Townsite. The preparation of revised drawings and the report covering implementation and design controls should be completed early in February, 1965.

In collaboration with the Ontario Research Foundation, the Corporation continued research in the development of a self-contained sewage disposal system suitable for the single family dwelling. One type was a totally enclosed unit, aimed at problems encountered in areas of permafrost and difficult terrain where water was scarce. With this unit, the effluent was re-used in closed circuit for flushing purposes, thus eliminating all out-flow and the need for disposal. One of these enclosed type units was installed for test purposes in late 1962 and operated through most of 1963 in an experimental house at the RCAF Station, Rockcliffe. A modified and improved unit has been installed in another research house project at Rockcliffe late in 1964, incorporating some of the knowledge gained from the previous unit. This unit will be under test and experimentation throughout 1965.

In co-operation with the Department of Northern Affairs and National Resources, a specially designed larger type of re-circulation sewage unit of the enclosed type was developed to handle six toilets at a school at Cape Dorset. The unit came into operation in 1964 and has proved satisfactory so far. Its performance will be studied and arrangements have been made for periodic sampling and analysis by the Ontario Research Foundation in Toronto.

Plans for 1965

Work will be undertaken as required for the Department of Northern Affairs and National Resources or for other agencies of the government.

Lending activities will continue at a level determined by the demand for and the supply of mortgage funds.

DEPARTMENT OF CITIZENSHIP AND IMMIGRATION

INDIAN AFFAIRS BRANCH

Responsibilities The administration of the Indian Act, as amended.

Matters relating to the social and economic development of the Indian population, the Indian Treaty obligations, the enfranchisement of Indians, and the administration of the Estates of deceased or mentally incompetent Indians.

Long-term Plans

The continued development of the natural resources of fur, fish, and game is essential for Indians of the north who depend on these resources for a livelihood. The Indian Affairs Branch, in co-operation with other agencies, will continue to foster the development of sound trapping and commercial fishing programs as well as domestic fishing and hunting projects. In addition, the Branch will continue to encourage and assist in the establishment of marketing co-operatives and the promotion of handicraft production and sales.

In the field of education, the Indian Affairs Branch will continue to arrange for the enrolment of Indian children in the Yukon Territory in schools operated under the Yukon Territorial Government with the exception of the Carcross Indian Residential School.

With regard to welfare services the long term objective is the total extension of such services to Indians administered by the Territorial welfare agencies.

Review of 1964 Operations

According to the Registered Indian Record, there were 5,235 Indians in the Northwest Territories and 2,142 in the Yukon as of December 31, 1963.

The production of handicrafts increased and local sales were up. Little inroad is being made in the southern market because prices seem to be higher than consumers are prepared to pay. Endeavours are being made to establish new sales channels in Alberta. These efforts are meeting some success, but a downward adjustment of prices is necessary if handicraft production in the north is to get its share of the Canada-wide trade.

Local sales are made directly by craft producers or co-operatives to the collector, consequently middlemen's profit does not enter into the picture. Assistance has been given to Indians in obtaining beads and hides. Hides and beads have been purchased, the hides processed, and both commodities sold to the craft producers at cost.

The improved fur prices noted in 1962-63 have declined slightly but were sufficiently firm to generate excellent interest in trapping, which resulted in an increased demand for grubstake and equipment. Keen interest was shown by Indians in travelling to isolated locations which have not been trapped by them for several years, thus complete 1964 figures may show an increase in overall fur production .

The yawl building program for the Great Slave Fishery produced an additional six yawls, bringing to twenty-three the total number of Indian crews operating on the lake. Many Indians have shown a keen interest in fishing on inland lakes but this program has not progressed as rapidly as desired owing to problems dealing with security of tenure and licence limitation on these lakes. Assistance in the form of supervision and equipment was again made available and a very successful winter fishing operation (December 1964) was realized.

The continued establishment of tourist accommodation on Great Bear Lake has provided increased opportunities for employment for Indians and about forty were employed in 1964. Opportunities for employment in connection with sports fishing increased slightly in other areas as well.

As the Department of Northern Affairs and National Resources has assumed responsibility in the Northwest Territories for placing Indians in employment, the Indian Affairs staff in the main carry a co-operative and consultative role in this field. The Indian Affairs Branch is deeply appreciative of the effective measures taken by the Department of Northern Affairs and National Resources placement staff to facilitate Indian placement and excellent teamwork has developed between the two departments. Branch staff assist in the selection of Indian workers and Indian Affairs pays the cost of transportation and other expenditures involved in facilitating placement in employment.

Construction of the Talson River power dam has been one of the main sources of employment, along with the Pine Point development and building of the Great Slave Lake railway. Contractors on the railroad placed 50 Indians on brushing the right-of-way. Branch staff have been active in placing Indians with Swanson's Lumber Company at Sweetgrass Landing. It is hoped that this development will offer permanent employment and plans are proceeding to assist Indians to relocate their families at the employment site.

The Great Bear Co-operative Association incorporated in June 1963 has been assisted by a \$5,000 loan from the Indian Affairs Branch. The Branch indicated to the Co-operative Union of Canada some time ago that it would co-operate in every way possible with that organization in connection with its study of group projects in the Great Slave Area.

Twelve hundred dollars was set aside to provide seed and fertilizer for those interested in both garden and field crops.

In education, the total Yukon enrolment is 540 pupils. Of these, 140 attend the Carcross Indian Residential School and the remaining 400 are in territorial schools. Out of 150 in grade 7 to 12, 118 attend the Whitehorse Public and Separate Schools whilst residing in the Yukon and Whitehorse Hostels. Fifty pupils are enrolled in the Whitehorse Vocational School, 42 in vocational courses and 8 in upgrading programs. Four students from the Yukon are enrolled in vocational courses in British Columbia. During the year, the Department made capital contributions of \$196,057 toward the expansion of school facilities at Dawson, Haines Junction, Mayo, Teslin, and Old Crow.

During the current fiscal year, fifty-two applications for housing assistance in the Northwest Territories and the Yukon were approved. Eight houses, started during the last fiscal year but not completed are expected to be finished by March 31, 1965. A combination staff quarters and warehouse was constructed at Fort Franklin, a community development road was built at Hay River, and landscaping of Agency lots at Yellowknife and Fort Rae was undertaken. In the Yukon, two water wells were constructed at Whitehorse Village.

Plans for 1965

Expansion of trapping will be continued to encourage greater utilization of fur resources, with more emphasis on managed programs, the preparation of pelts, and dissemination of information on fur markets. Development of commercial fishing on inland lakes will also be given renewed attention and, with additional supervision now available, some major progress is anticipated.

A more comprehensive handicrafts development program will be adopted as staff and money become available. A survey will be made of handicraft production and marketing in the Northwest Territories so that its full potential may be exploited for the benefit of the Indian people.

Indians will be encouraged by both financial assistance and technical aid to supplement their diets and cash incomes by cultivating small kitchen gardens generally and undertaking more extensive crop growing projects on good arable areas.

A Community Development Officer will be appointed for the Yukon, and another for the District of Mackenzie. A Welfare Consultant will be appointed with headquarters at Fort Smith.

In social welfare the Branch is concerned with the adjustment of relief assistance rates to conform with those in effect for non-Indians of both the Yukon and Northwest Territories and in both instances noticeable progress is being achieved.

Integrated schooling reached maximum enrolments with the inclusion of Old Crow in the territorial school system. With the exception of those attending the Carcross Indian Residential School, all Indian pupils in the Yukon attend territorial schools. It is anticipated that secondary school enrolment will continue to increase and that growing numbers will complete their schooling in vocational programs to equip them for employment.

Fifty-one houses will be built in the North, and an Agency residence and office at Fort Good Hope. Provision is made also for construction of a summer water line which will be installed at Hay River, and for landscaping carried out at Fort McPherson, Hay River, Fort Rae, and Yellowknife.

IMMIGRATION BRANCH

Responsibilities

Implementation and administration of the Immigration Act and Regulations as elsewhere in Canada, including admission of immigrants, non-immigrants, returning Canadians, and returning residents and deportation of undesirables. In implementing the policy of the Government in respect of immigration, the Immigration Branch considers that it has an active part to play in promoting the development of the economy. This includes agriculture, natural resources, large scale industries, construction projects, small industries, businesses, and services.

Long-term Plans

Normal planning to meet responsibilities including a continuous assessment of the opportunities that are suitable for and will attract immigrants to the northern part of Canada.

Review of 1964 Operations

Thirty ports of entry operated in the far North. One was a full-time Immigration office, six were Customs offices, and the remainder were maintained under an arrangement whereby officers in charge of R.C.M.P. detachments, heads of certain Canadian meteorological stations, and commanding officers of certain R.C.A.F. stations have been designated as Immigration Officers in Charge and Special Inquiry Officers to administer the Immigration Act and Regulations. At these ports of entry, 97,564 persons were examined comprising 24 immigrants, 9,573 returning residents, and 87,967 non-immigrants. During 1964, there were no deportations.

A total of 108 immigrants were placed in employment in the Yukon and Northwest Territories by immigration officers. Also during 1964, 13 immigrant businesses were reported as having been established in the Yukon and one in the Northwest Territories. The immigrants who established these businesses originated from the Netherlands, Germany, England, Hungary, Ukraine, U.S.A. and Italy. The total purchase price of the fourteen enterprises amounted to \$233,700 of which \$75,400 was paid down.

The Medical-Welfare Agreement between the Federal Government and the Northwest Territories, covering assistance to immigrants who become indigent through accident or illness during their first year's residence in Canada, was continued.

Plans for 1965

Similar to 1964.

CROWN ASSETS DISPOSAL CORPORATION

Responsibilities

Disposal of surplus Crown assets declared by Government departments or agencies operating in the North.

Disposal of surplus United States Government--owned surplus property located in Northern Canada, under the provisions of Canadian Note 140 dated August 28th, 1961 and United States of America Note 52 dated September 1st, 1961.

Long-term Plans

Normal planning to meet requirements on disposals of surplus Government-owned assets and special operations planning based on changing requirements caused by phasing out of certain United States Government operations in the Far North.

Review of 1964 Operations

CADC representatives carried out inspection and disposal of surpluses in the Yukon Territory and District of Franklin (Baffin Island). The major disposal operation planned to clean up DEW Line beach heads and sites during the navigation season of 1964 was not fully accomplished during the navigation season owing to extreme ice conditions in the Western Arctic sectors.

Plans for 1965

Continuance of normal disposal operations and completing removal of surplus from DEW Line sites that could not be reached during the navigation season of 1964 owing to extremely adverse ice conditions.

DOMINION BUREAU OF STATISTICS

Responsibilities Procurement and analysis of statistics for the Northwest Territories and the Yukon and their publication in the Bureau's regular reports.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1964 Operations

Census

Representatives of the Census Division discussed with officials of the R.C.M. Police the question of having members of the force participate in completing the 1966 Census of Population and Agriculture in the north. The intention is that DBS will forward to the various detachments of the R.C.M. Police, maps, forms, and instructions necessary for taking the census in isolated areas at the beginning of 1966.

Law enforcement

Statistics are published concerning the following aspects of law enforcement: cases heard by the Territorial Courts and Police Magistrates' Courts dealing with indictable and summary conviction offences and juvenile delinquency; appeals heard by the Courts of Appeal; the movement of guardroom prisoners; R.C.M. Police statistics and the Fire Marshal's fire crime statistics for the Yukon and Northwest Territories.

Health

Annual Returns of Hospitals were sent to 31 hospitals in the north for the 1964 reporting year - 26 to the Northwest Territories (17 federal, 8 public, and 1 private) and 5 to the Yukon (3 federal and 2 public). The distribution of these Returns was through the Territorial Hospital Insurance Service Board; no direct contact was made with any hospital in the north. Data obtained on these Returns were tabulated and published in a series of Reports - Hospital Statistics - Vols. 1-7 (83-210 to 83-216) plus Preliminary Annual Report (83-217).

The Yukon Superintendent reported, on a four-weekly basis, all cases of notifiable diseases in his Territory. Weekly reports covering the incidence of communicable diseases were received from the Regional Superintendents of the Northwest Territories and the Alberta Department of Health. The foregoing data were incorporated into the Dominion Bureau of Statistics' Annual Report of Notifiable Diseases; in addition, the data were included in the Dominion Bureau of Statistics' Notifiable Diseases Weekly Summary.

Hospitals in the Yukon and the Northwest Territories report information on tubercular patients admitted, readmitted, and discharged during the year. Since January 1961, a new system of case notification from the provincial tuberculosis case registers has been in operation in Canada. Also co-operating in the system were the Yukon and the Northwest Territories, but in the absence of a case register, their tuberculosis notification cards were submitted monthly to the Dominion Bureau of Statistics by the Directorate of Indian and Northern Health Services of the Department of National Health and Welfare. Information from the case notification system formed part of the Dominion Bureau of Statistics' Monthly Reports, "Incidence of Tuberculosis".

Vital Statistics

Vital statistics tabulations for the Yukon and Northwest Territories are prepared annually by DBS from copies of registrations of births, stillbirths, marriages, and deaths supplied routinely to the Bureau by the Territorial Division of the Department of Northern Affairs and by the Commissioner of the Yukon Territory. Certain of these tabulations are supplied to the two Northern administrations or are available on request.

Both the Yukon and NWT administrations were separately represented on the Vital Statistics Council for Canada, composed of provincial and territorial officers responsible for the administration of vital statistics and which meets annually to discuss legislative, registration and statistical matters relating to the vital statistics system.

Education

Since 1955 reports on educational statistics of the same type as used in the Provinces have been collected from the public schools of the Yukon through the Superintendent of Schools at Whitehorse.

The same basic reports on teachers and enrolment have been adopted for the schools in the Northwest Territories and these have been collected annually by the Department of Northern Affairs and National Resources beginning with the school year 1959-60.

These reports also include one on promotion and non-promotion of pupils similar to that used for the Indian schools but additional to the report forms used for the public schools of the provinces. The public school and the Roman Catholic separate school at Yellowknife and the Roman Catholic Separate School at Hay River report the same as federal schools.

As a result of a federal-provincial conference on education statistics additional data on teachers and pupils in the public schools of the provinces will be collected beginning in the fall of 1965. These data will also be collected from the schools in the Yukon and the Northwest Territories.

The Department of Northern Affairs and National Resources provided some information on expenditures on education including the finances of the Public School Board at Yellowknife. The Roman Catholic Separate School Board at Yellowknife reported finances directly to the Education Division.

Expenditures on education by the Territorial Governments of the Yukon and the Northwest Territories were extracted from territorial public accounts.

Statistics on Elementary and Secondary education in the Yukon and the Northwest Territories are now being shown in all publications of the Education Division relative to this field.

International Travel

Statistics on international travel movements through ports in the Yukon were published monthly. These international statistics were obtained through customs offices at ports in the Yukon Territory; data on automobile movements were recorded by the Department of National Revenue and compiled by the Dominion Bureau of Statistics, and other travel movements were reported by the Department of Citizenship and Immigration.

Personal Income

Personal Income for the Yukon and the Northwest Territories is included in the National Accounts, Income and Expenditure. In 1963, it was \$52 million out of \$32,771 million, i.e. about one-sixth of one per cent of Canadian personal income.

Industry and Business

Net value of commodity production data are available up to 1963 from 1926 for the fishing, trapping, mining and electric power industries, from 1939 for manufacturing, and from 1940 for forestry (see Survey of Production report, Vol. 41).

The Industry Division regularly collected statistics for the Northwest Territories and the Yukon on electric power, logging, manufacturing and mining. Fishing statistics were collected for the Northwest Territories and pipeline statistics for the Yukon. The confidential clauses of the Statistics Act preclude publication of the statistics by industry and territory except for mining, fishing, and pipelines. To avoid disclosure, statistics for the two areas combined are published in the case of both the electric power and manufacturing industries, and with British Columbia in the case of the logging industry.

The Merchandising and Services Division collected statistics from a sample of retail and wholesale trade businesses for the purpose of estimating the volume of such business activities. Separate figures are not published for the Yukon and Northwest Territories. In the case of Retail Trade, the Yukon and Northwest Territories are included with British Columbia. In the case of Wholesale Trade, figures are published only for Canada with no breakdown by regions. Statistics were also collected from hotels, power laundries and dry cleaning plants, and motion picture theatres for the purpose of measuring the extent of these business activities. The data are combined with those of British Columbia for publication except in the case of theatres where figures are published for the Yukon and Northwest Territories.

Surveys of food costs were analyzed in respect of 6 locations in the Yukon and Northwest Territories in connection with a general review of Isolation Allowances.

Public Finance

Statistics on actual revenue, expenditure, and debt of the territorial governments have been included in the Dominion Bureau of Statistics' annual reports on "Financial Statistics of Provincial Governments - Actual", for a number of years.

The data are obtained from the Public Accounts of the Territorial governments, supplemented by information supplied by territorial treasury officials.

Quarterly statements of the revenue and expenditure of the government of the Northwest Territories are received regularly from the Department of Northern Affairs and National Resources and are incorporated into the Dominion Bureau of Statistics' quarterly statement of government transactions related to the National Accounts. Also incorporated are the revenue and expenditure of the Yukon Territory, compiled from the Territorial Public Accounts.

Actual financial data on revenues, expenditures, assets, and liabilities for the four incorporated municipalities in the territories are obtained directly from the municipal officials and are included in the Dominion Bureau of Statistics' annual reports "Financial Statistics of Municipal Governments - Actual".

Data on rates of the principal taxes levied by the two territorial governments and their four incorporated municipalities are included in the Dominion Bureau of Statistics' annual report "Principal Taxes and Rates".

Liquor

Data on liquor sales by type, and on profits of the liquor boards, are obtained from the liquor board authorities in both territories for inclusion in the Dominion Bureau of Statistics' annual report "Control and Sale of Alcoholic Beverages in Canada".

Transportation and Communications

Highway statistics for the Yukon Territory and the Northwest Territories were provided by the Departments of National Defence, Northern Affairs and National Resources, and the officials of the local municipalities. Also reported by governmental authorities were statistics of motor vehicles registrations, gasoline and deisel oil sales, traffic accidents involving vehicles, and revenues derived from licences and taxes arising out of the operation of motor vehicles. Freight and passenger statistics were supplied by common and contract motor carriers operating within and in and out of both the territories.

Statistics of railway operations in the Yukon Territory were provided by the White Pass and Yukon Route Railway.

Reports of civil aviation were regularly received from over two dozen carriers located in, or servicing, the Yukon Territory and Northwest Territories.

Water Transportation reports were regularly submitted by companies operating cargo vessels on the Mackenzie River system. In addition vessels entering the ports of the Northwest Territories reported particulars of cargoes loaded and unloaded.

Telegraph and cable statistics for the Yukon and Northwest Territories were obtained from the C.N.R. in Montreal.

Telephone statistics were provided for the Northwest Territories by the Bell Telephone Company of Canada and the Yellowknife Telephone Co. Canadian National Telecommunications provided telephone statistics for both the Yukon and Northwest Territories.

Employment

Employment and payrolls of the Government of Canada and its Crown Corporations, for services carried out in the Yukon and Northwest Territories, were covered by reports submitted each month by the responsible departments and corporations and in some cases by means of official documents of the Civil Service Commission, the Treasury Board, and the Privy Council.

The government of the Yukon Territory and its Crown Corporations provide monthly statements of their employment and payrolls. The government of the Northwest Territories submits a quarterly statement on staff of the Liquor Commission. Departmental Services of the Northwest Territories' government are performed by employees of the Government of Canada. These employees are reported in statistics for the federal government departments.

At present, no information is collected with regard to municipal government employment and payrolls in the Territories and it is not presently known when such a survey will be undertaken.

Monthly data on employment, payrolls, and man-hours were collected from a few industrial establishments in the areas engaged in mining, construction, transportation, storage, communication, and catering, and a few in manufacturing.

Statistics for these areas are not separately published, but are contained in the Canada figures in "Employment and Payrolls" and "Man-hours and Hourly Earnings".

Fur

Data were obtained on the numbers and values of pelts taken in the regions for the fur season 1963-64. For the Northwest Territories the number of pelts exported and the prices paid to trappers was provided by W. G. Brown, Deputy Commissioner. For the Yukon this information was provided by J. B. Fitzgerald, Director of Game.

Plans for 1965

No change in plans for the collection of data on operations of hospitals in the North is anticipated.

It is expected that reporting from the Yukon on notifications of communicable diseases except tuberculosis will be on a weekly rather than a four-weekly basis.

The Vital Statistics Council for Canada is presently reviewing the content of forms used for registering births, stillbirths, marriages, and deaths in the provinces and territories with a view to adoption of standardized forms in all areas. Although no change is anticipated for 1965, it is likely that the registration forms for the two Territories will be revised within the next 2-3 years to conform to the recommendations of the Council.

Discussions will be initiated with Territorial officers concerned regarding amending legislation to provide for compulsory registration of stillbirths of less than 28 weeks' gestation.

Consultations have been held with various officials of the Department of Northern Affairs and National Resources regarding the collection of data on the operations of their proposed prison and probation systems.

It is expected that discussions will be held with members of the Inter-departmental Committee on Isolated Posts Regulations regarding the implementation of the last review of comparative food cost measurements recently carried out at several locations in the Yukon and Northwest Territories.

ELDORADO MINING AND REFINING LIMITED

Responsibilities Maintenance, on a caretaker basis, of a shut-down uranium mining plant at Port Radium on the south-east shore of Great Bear Lake.

Long-term Plans

None.

Review of 1964 Operations

Maintenance was continued. The facilities were used by a number of Eldorado employees engaged in the salvaging of spare parts, supplies equipment at the property, and the preparation of these for shipment to Eldorado's Saskatchewan mining property and elsewhere; they were also used by a mining company operating a nearby silver property.

Plans for 1965

Caretaking of the Port Radium plant will continue. Part of the facilities will be leased to a mining company operating a silver property nearby.

DEPARTMENT OF EXTERNAL AFFAIRS

The Department of External Affairs has supplied the following statement on U.S. Government activities in Canada which were current during 1964. Other activities which have been described in earlier reports and the status of which did not change during the year are not included.

Winter Maintenance of the Haines Road

Arrangements for winter maintenance of the Haines Road during the 1964-65 winter season were formally negotiated between the Canadian and the United States Governments, the necessary authority to work out the arrangements in practice being given, so far as the Canadian Government is concerned, to the Department of Public Works. With reference to the centre portion of the Road, lying in Canada between Mile Post 48 and Mile Post 94, the United States Embassy advised the Department of External Affairs by Note on September 10, 1964, that the State of Alaska had requested that the Government of Canada agree to the continued maintenance of the Haines Road during the coming winter, and that the Government of Alaska was prepared to participate in such winter maintenance on the same reimbursable basis as last year. On September 30, the United States Embassy was advised by Note of the following decisions of the Government of Canada:

- (i) That agreement had been given to snow clearance of the centre portion of the Road, during the 1964-65 winter season, on the same experimental basis as last year, with the qualification that this winter's operation would be the final part of the experiment on this basis;
- (ii) That the Department of Public Works had been granted authority to negotiate directly with the State of Alaska for the rental of road maintenance equipment of same basis as for the 1963-64 winter season.

With respect to the southern portion of the Haines Road, which lies mostly in the Alaska Panhandle, clearance will be done by the United States Army as in the past. With respect to the northern portion, this has been kept open in the past by the Canadian Army on a basis of reimbursement from the United States Army, and will this year be kept open on the same basis by the Department of Public Works which has since assumed responsibility for the Road.

These arrangements with respect to the southern and northern portions of the Road during the 1964 -65 winter season were confirmed by a separate exchange of Notes between the Department of External Affairs and the United States Embassy.

DEPARTMENT OF FISHERIES

CONSERVATION & DEVELOPMENT, AND INSPECTION SERVICES

Responsibilities Conservation, protection, and development of fisheries through enforcement of the Fisheries Act, Fish Inspection Act, and their regulations.

Long-term Plans

To encourage the development of commercial, sport and domestic fisheries wherever conditions are suitable, having regard to markets, transportation, access, and other factors. To promote greater utilization of fishery products by inspection and assistance in the development of technological processes to obtain consistently high quality. To conserve and maintain the desirable fish populations by application of modern conservation measures whenever necessary.

Review of 1964 Operations

The Department's establishment at Hay River continued to maintain close control over the major fishery in Great Slave Lake. Fishery Officers worked far afield from this base in connection with the eight control areas of the expansion program in other lakes of the Territories and the five sub-areas in the Mackenzie Delta area with attendant patrols. In the Northwest Territories' lake expansion program, the commercial fishing industry continued to be attracted to a number of areas opened to exploitation. Management control work was continued and scientific data collected.

There was close collaboration with the Department of Northern Affairs and National Resources in its efforts to expand sport and commercial fisheries. These include substantial fisheries and marine mammal programs in the Mackenzie Delta area, the Keewatin District bordering Hudson Bay, Cambridge Bay, and Frobisher Bay, as well as a number of relatively small programs.

The patrol vessels "Marila", "Rae Point", and several smaller craft carried out regulation enforcement on Great Slave Lake assisted by a small fleet of snowmobiles. A 17-foot patrol craft was stationed in the Mackenzie Delta. Here, and in other areas, extensive use was made of chartered aircraft.

The sport fish development program was continued in the Yukon by the Fish Culture Development Branch. A limited number of eyed rainbow trout eggs were introduced to the Long and Ruth Lakes (Whitehorse area). These lakes, which had been stocked in three of the past four years, were well supplied with fingerling trout; three to six-pound trout were available to anglers in Long Lake. An assessment survey of Hanson Lakes near Elsa indicated the coarse fish eradication program in 1963 to have been a complete success; a stocking program is proposed when the lakes are completely detoxified in 1965. Surveys were undertaken on Chadburn Lake, near Whitehorse, and Wye Lake near Watson Lake to determine their suitability for future rainbow trout introductions.

Pollution

Negotiations with Discovery Mines Ltd. indicate that toxic components from the company's Mount Freegold operation should not endanger fish life in Big Creek; an on-site inspection to assess the situation will be conducted in 1965. Negotiations have been initiated with local authorities regarding the possible replacement of DDT by Baytex for mosquito control programs. Baytex is far less toxic to fish life than the normal control formulation of DDT.

Plans for 1965

The expansion of activities and other programs will continue in close collaboration and liaison with scientists of the Fisheries Research Board, and will entail additional work by Fishery Officers in connection with protection of the resource, quota enforcement, and ensuring proper collection of statistical catch material and scientific data.

The program of sport fish development in the Yukon Territory will be continued with further rainbow trout introductions to lakes of the Mayo-Elsa area.

Inspection Service activities will be continued and as of April 1, 1965, all processing plants will require to be registered.

FISHERIES RESEARCH BOARD OF CANADA

Responsibilities Investigations of the marine, freshwater, and anadromous animal resources of the Canadian Arctic, involving biology and utilization. Study of biological oceanography in relation to these resources.

Long-terms Plans

To continue and expand fish and marine mammal studies, and to recommend wise exploitation of arctic marine and freshwater resources.

Review of 1964 Operations

Fisheries Investigations

Char Studies

Nettilling Lake. A survey of the arctic char (Salvelinus Alpinus) potential of Nettilling Lake, Baffin Island, was initiated in co-operation with the Department of Northern Affairs and National Resources in the early spring. Results to date indicate that large areas of the lake have only a small land-locked char population and that only certain locations near main inflow rivers provide areas where reasonable fishing success might be expected during the summer months. Many of these fish are parasitized by Diphyllbothrium sp. The anadromous char started their return to the lake on September 5 and were sampled until September 11 when weather conditions made it necessary to close the survey. Growth rate of the char in Nettilling Lake is slow and production is very limited. Use of the accumulated capital stocks of both landlocked and anadromous char on a short-term basis is suggested as an efficient method of utilization.

Frobisher Bay. During the period 1958 to 1963 the 10,000 pound quota commercial fishery for arctic char in Frobisher Bay has shown a steady decline in the catch per unit of fishing effort while average size and age of the fish have remained constant. No further decline in catch per unit of effort was found in the 1964 fishery. An estimated reduction of 70% of the sport and subsistence fishery over previous years is considered an important factor in limiting further decline in fishing success.

Labrador. A program of study was initiated on the arctic char in the Nain area of the Labrador coast in order to gather information related to the population dynamics of the stocks under conditions of a relatively heavy fishery.

Limnological Studies

Great Bear Lake

In the second year of the limnological and fisheries survey of Great Bear Lake the two northern arms, Smith and Dease, were examined and the morphometry plotted. Both arms had many reefs and shoals within a few feet of the surface. Titrations made at selected locations throughout the lake showed no lack of oxygen in the water. The high levels indicate a turnover of the bottom waters but the near constant water temperatures below 200 metres obscure the mechanism of this turnover.

Lake trout (Salvelinus nanaycush) were found to be universally distributed throughout the lake with small catches resulting from gill netting in even the deepest water and at distances of 18 miles from nearest land. Whitefish (Coregonus clupeaformis) were fairly numerous in the more sheltered bays only. Other species of fish caught included pickerel (Stizostedion vitreum), pike (Esox Lucius) and four-horned sculpins (Myoxocephalus quadricornis thompsoni).

Invertebrate organisms tended to be restricted to depth and possibly uniform temperature regimes.

Baker Lake

Observations made during the winter at Baker Lake showed the presence of a slightly saline layer on the bottom indicating that under certain conditions the sea has access to the lake. Although the salinity found was very dilute (50 ppm at 25 metres and 342 ppm at 60 metres) the proportion of constituents clearly indicated marine origin.

Marine Studies

Exploratory fishing from the M.V. Salvelinus was continued by gill netting, bottom trawling, and long lining. Three stations were sampled a total of 14 times for temperature, salinity observations, and collection of plankton samples. Fishery work consisted largely of the locating and sampling of cod, principally Gadus ogac. Suitable trawling bottom areas for cod in the Coronation Gulf area were found to be scarce while echo traces showed a very low general abundance of fish except in semi-enclosed harbours and bays.

Examination of ages of cod taken during the past three years indicate complete dominance by single year classes suggesting the abundance of cod may fluctuate markedly from period to period.

Marine Mammal Investigations

Harp Seals

Previous to the commercial harp seal fishery in the Gulf of St. Lawrence in the period March 1-11 a total of 2874 young harp seals (whitecoats) were tagged. Subsequent recovery of tags and reported kills indicated a production of 120,000 young seals. A confirmatory estimate based upon an aerial photograph survey and other sightings of breeding females raised this estimate to 150,000 young. This population with a known kill of 80,500 animals indicates a total fishing mortality of 53.7%. In one group of seals photographed on three separate days the counts suggested that over 65% of births occurred between the dates February 28 to March 4.

Numbers of breeding female and young harp seals in the Belle Isle region ("Front") were estimated from a photographic aerial survey from March 7-11. Resulting estimates were adjusted to include breeding groups missed in the photographic survey to give a population estimate of 200,000 young seals. Kill of 179,000 young reported by ships alone indicated the commercial fishery removed 80 to 90% of the annual production.

Under this intensive fishery the Front stocks of harp seals will continue to decline despite an increase in fertility shown in recent years.

White Whales

Sampling of the white whale fishery at Whale Cove in Hudson Bay from a net fishery was concluded with adequate information having been collected for determining the absolute age of specimens and vital statistics of the population.

East Coast Whales

Whale sightings reported from a new limited whale fishery off the east coast of Nova Scotia, personnel of the M.V. Harengus, officers of the cable ship Lord Kelvin, R.C.A.F. and other sources provided information on species distribution and abundance of whales in the Gulf of St. Lawrence and off-shore areas.

Ten species of whales, dolphins, and porpoise totalling about 800 separate animals, and over 32 separate herds of dolphins and porpoise, were reported by these observers.

Grey Seals

Information accumulated from tagging and marking experiments on young grey seals (Halichoerus grypus) show an active dispersal over a wide area from their place of birth. The large concentrations of grey seals found at Miquelon and scattered along the Newfoundland and Labrador coasts appear to originate in the southern Gulf of St. Lawrence and eastern Nova Scotia.

Codworm

The relative importance of harp, grey, and harbour seals as vectors of codworm (Porrocaecum decipiens), based upon reported incidence of infestation and present population densities of seals in different areas, is shown in the following table:

Relative importance of seal as vector			
	<u>Harbour</u>	<u>Grey</u>	<u>Harp</u>
Southern Gulf	3.3	13.6	83.1
Halifax to Cape North	46.0	54.0	-
Bras d'Or Lakes	17.0	83.0	-
Halifax to Yarmouth	+	-	-
Bay of Fundy	100-	+	-
Sable Island	18.0	82.0	-

In the Gulf of St. Lawrence the harp seal, despite its short residence, is the most important vector of codworm; grey and harbour seals fill this position elsewhere on the coast.

Narwhal

Studies of the biology of the narwhal were continued in Milne Inlet, northern Baffin Island. A total of 18 animals, mostly females and their calves, were netted. Stomachs contained a few squid beaks and cod otoliths but no signs of recent active feeding. Observations on behaviour during the summer migration of whales into the inlet suggest that mating may occur at this time.

Narwhals are gregarious, usually travelling in groups or pods of up to 10 animals. On several occasions herds of between 100 and 200 whales were seen in the bay while on one occasion a herd estimated to contain at least 2000 narwhals of all sizes was observed.

Biological Oceanography Investigations

Zooplankton

Examination of zooplankton collections taken by the Canadian vessels Baffin and Sackville during the Norwestlant 2 portion of the 1963 ICNAF environmental survey of Greenland waters has been completed and the distribution of zooplankton biomass in the upper 100 metres has been analysed. The region of maximum standing crop in the central Labrador Sea and central Davis Strait was characterized by the presence of the greatest number of many of the larger copepodites of Calanus finmarchicus as well as several other species of copepods, amphipods, chaetognaths, pteropods, adult euphausiids, polychaetes, and ostracods. Most abundant groups in the less rich areas, especially over the Greenland banks, were larvae of echinoderms, cirripedes, and decapod crustaceans. Locations showing the highest zooplankton quantity were generally warmer than areas supporting a smaller biomass. Arctic species were not found in the water warmer than 3°C while Arctic and Atlantic species were seldom found together in water colder than 1.5°C.

Phytoplankton

Examination of samples collected during the Norwestlant 2 survey show the degree of mixing and penetration of Atlantic into arctic masses through distribution of different species.

A number of nannoplankters have been found which produce starch grains and arctic water samples show abundant numbers (up to 9 million/litre) of these starch cells existing in a free state. No grazers have been found capable of digesting starch in this form and large concentrations of these grains are found in the faecal pellets of the grazers.

Quantitative samples of phytoplankton from surface waters to 2300 metres depth were collected from the area between the Labrador Sea and Hall Basin by the Department of Mines and Technical Surveys. This material constituted the first samples of their kind from deep northern water.

Landlocked Fiords

Work was continued on landlocked fiords as natural laboratories for the study of marine production. A survey of Winton Bay, on the east coast of Baffin Island, was made in August. The landlocked head of this fiord is colder than the previously studied Ogac Lake, and supplied valuable data on a number of organisms.

Plans for 1965

Continued study of narwhal biology at Pond Inlet.

Observation of the narwhal fishery in the Gulf of St. Lawrence.

Sampling for porrocaecum in grey seals in the Gulf of St. Lawrence.

Observation of the bowhead whale fishery in the western Arctic.

Distribution and sampling of the whale catch on the Atlantic Coast.

Completion of the fisheries and limnology study at Great Bear Lake.

Continued exploratory fishing in the Central Arctic from the M.V. "Salvelinus", operating out of Cambridge Bay.

Biological oceanographic studies in the Frobisher area from the M.V. "Calanus".

Continued monitoring of Arctic Bay char fishing.

Observations on the Wellington Bay char fishery.

Continued preparation of a monograph of arctic phytoplankton.

DEPARTMENT OF FORESTRY

Responsibilities To prepare forest inventories and forest management plans; to promote the adoption of improved methods of forest management and protection from fire best suited to the region; to conduct annual surveys and related research on forest insects and diseases; to provide advisory services to public and private forest management agencies on forest insect and disease control.

Long-term Plans

To determine the potentialities of the forest resources of the north, and to assist in the preparation of plans for their protection and utilization.

Review of 1964 Operations

Administration Branch

A scientist was seconded to the Yukon Forest Service for the months of June and July, and spent the remainder of the summer assisting the Mackenzie River Survey, obtaining equipment, checking development of forest stands in various parts of the Yukon, arranging an experimental area near Watson Lake, and checking the woodlot of the Dominion Experimental Farm near Haines Junction.

A party of five surveyed forest areas along the Peel river and at the southern end of the Mackenzie delta. Owing to poor weather conditions medium scale air photography requested for the area could not be flown. This greatly handicapped the survey which has been discontinued until 1966 when new air photography and forest cover maps should be available. The timber was generally small, but fairly extensive patches of sawtimber were found which should be of considerable local importance. Persistence of branches and twist will probably make the timber of lower grade than that from more southerly areas. A new plywood work boat, 28 feet long, equipped with a Dowty Turbo-jet Unit and an inboard motor, was tested. It ran from Fort Nelson to the delta during the spring breakup and was then used on the open courses and shallow channels of the delta. It did not operate well in weeds but was otherwise an unqualified success.

Forest Research Branch

There were no field parties in the north. Two reports based on earlier work were published. These were:

Jeffrey, W.W. 1964. Forest Types Along Lower Liard River, Northwest Territories. Canada Department of Forestry Publication No. 1035, 103 p.

Wagg, J.W. Bruce, 1964. White Spruce Regeneration on the Peace and Slave River Lowlands. Department of Forestry Publication No. 1069, 35. p.

Forest Entomology and Pathology Branch (Alberta Region) in the North

In the Mackenzie District, operations featured a combination of air, boat, and ground surveys employing two to four technically trained persons at different times from June to September. In addition to general detection surveys and damage appraisals of forest pests, special attention was paid to the spruce budworm, larch sawfly, yellow-headed spruce sawfly, leaf miner, and winter drying of conifers. Boat surveys were confined to the Slave River, the south shore of Great Slave Lake, and the Lower Peace River in Wood Buffalo Park. The bark beetle outbreak near Big Island, Wood Buffalo Park was resurveyed to determine the extent of damage to spruce. During the year about 3,200 miles were travelled by truck, 800 by boat, and 3,500 miles by charter aircraft. Reports covering operations in the north are:

Brown, C.E., Stevenson, R.E., and Baranyay, J.A., 1965. Province of Alberta, Forest Insect conditions. In Annual Report of the Forest Insect and Disease Survey. Department of Forestry, Ottawa.

Robins, J.K. et Al. 1965. Annual District Report, Mackenzie District. In Annual District Reports, Forest Insect and Disease Survey, Alberta Region. Dept. of Forestry, Forest Entomology & Pathology Branch, Calgary, Alta.

Forest Products Branch

No field work was carried out in the north but a small amount of Mackenzie Delta Timber was received for tests of suitability for construction.

Plans for 1965

Administration Branch

No definite field work is planned for 1965 in Northern Canada though one or more men from the Branch may spend some time there.

Forest Research Branch

A field party of a research officer and one student will spend approximately four weeks in the vicinity of Hay River and Fort Providence collecting further ecological data for studies of occurrences and development of white spruce reproduction. This work was originally planned for 1964 but was delayed owing to a shortage of staff and other research commitments. A land classification research officer may make a reconnaissance of portions of forest lands in the Yukon Territory, preparatory to more detailed studies of soil, land form, and vegetation as the basis for classification of forest land resources with respect to productivity and management.

Forest Entomology and Pathology Branch (Alberta Region) in the North

Surveys of forest insects and diseases generally will be continued; special surveys and damage appraisals will be made of major pest conditions as become apparent during the year.

Forest Products Branch

Limited tests will be made on Mackenzie Delta timbers to ascertain their suitability for construction.

DEPARTMENT OF JUSTICE

Responsibilities

The administration of justice in the Territories, including the organization and maintenance of territorial courts of civil and criminal jurisdiction; the appointment of judicial officers, Justices of the Peace, Magistrates, Juvenile Court judges, and related personnel; the direction and conduct of court proceedings on behalf of the Crown, including prosecutions under the Criminal Code and the Territorial Ordinances.

Long-term Plans

To improve, develop, and organize the administration of justice in the Territories in such a manner that, at the appropriate time, it may be transferred to the Territorial working system. The "administration of justice" in this context includes the organization of the courts, the conduct of criminal and civil litigation on behalf of the Crown, and all related matters.

Review of 1964 Operations

Criminal proceedings were conducted by Crown counsel, when necessary, before the respective superior courts, Justices of the Peace, and Police Magistrates, the last-mentioned also acting where appropriate as Juvenile Court judges.

Proceedings which were not held in the larger centres were dealt with by local Justices of the Peace or when appropriate by the Magistrates and Superior Court justices on circuit. The day-to-day administrative duties respecting the courts were carried out by the clerks of the court and sheriffs.

A senior officer of the Department was stationed in the Yukon Territory.

Plans for 1965

A senior officer of the Department may be stationed in the Northwest Territories. Steps will be taken to amend the Juvenile Delinquents Act in both Territories.

DEPARTMENT OF LABOUR

Responsibilities Conciliation and other services for maintaining good industrial relations; administration of the fair wages policy, fair employment practices, annual vacations with pay, and female employees equal pay legislation; promotion and administration of the municipal winter works incentive program; sale and administration of government annuities; compensation to government employees for occupational injury or illness; development, promotion, and co-ordination of technical and vocational training programs; surveys of wage rates, hours of labour, and other working conditions.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1964 Operations

Industrial Relations

The Department processed two applications from trade unions for certification of bargaining agents, as well as one application for the revocation of a certification issued to a trade union as bargaining agent. These applications affected employees of companies in the Yukon Territory. Two industrial disputes involving companies and trade unions in the Yukon were mediated.

Technical and Vocational Training

The Council of the Yukon Territory has passed an Apprenticeship Act similar to that in effect in the Northwest Territories. Ongoing school-centred programs are being shared under the Technical and Vocational Training Agreement by the federal government at Whitehorse Vocational School and F. H. Collins Secondary School. Vocational upgrading evening courses are given in both centres.

For the Northwest Territories, the new Churchill Vocational Centre was established recently.

Small business management courses were operated at Fort Smith, Hay River and Yellowknife. The Northwest Territories is developing a Tradesmen's Certification program (voluntary) involving tests for about twenty trades. In the apprenticeship program there are seven or eight apprentices under training and a number of others on probation. There are also miscellaneous ongoing courses at Hay River, Holman, Sugluk, Tuktoyaktuk, Churchill, and Baker Lake. The fur garment manufacturing course has been operating at Tuktoyaktuk for two years, and is expected to become a self-sufficient co-operative industry in the near future.

The western region representative for the Technical and Vocational Training Branch travelled to the Yukon and Northwest Territories several times during the year to assist territorial officials with the development of training programs.

In addition, Ottawa-based officers of the Branch consulted from time to time with the officials of the Department of Northern Affairs and National Resources and the Commissioner of the Yukon Territory and his Vocational Program Director regarding the extension and improvement of their programs.

Accident Prevention and Compensation Branch

Claims of federal government employees, regularly working in the Yukon and Northwest Territories, for compensation for occupational accidents or diseases were received, adjudicated, and paid by the Alberta Workmen's Compensation Board, under a federal-provincial agreement. A total of 521 claims was received and disbursements were \$73,445.00.

Economics and Research Branch

The Economics and Research Branch conducted two annual surveys - one on wage rates, salaries, and hours of labour, the other on working conditions - covering 24 establishments in the Yukon Territory and 27 in the Northwest Territories. Not included in these figures are two corporations - the Northern Canada Power Commission and the Royal Bank of Canada - whose returns cover all localities served in both territories. The Branch also maintained a file of collective agreements covering employees in these areas.

Annuities

No statistics are available on the number of government annuities sold in the North but it is believed to be small. Sales and other business relating to government annuities were carried out by correspondence.

Municipal Winter Works

During the winter of 1963-64, one municipality in the Yukon Territory and 14 in the Northwest Territories carried out projects under the Municipal Winter Works Incentive Program. The estimated costs of these projects were \$4,000 and \$87,000 respectively. No projects have as yet been submitted for the winter of 1964-65 by municipalities in the Yukon, but four municipalities in the Northwest Territories have submitted projects with an estimated cost of \$20,000.

Winter House Building

Under the 1963-64 Winter House Building Program, applications were submitted in respect of seven houses built in the Yukon Territory and twenty-seven in the Northwest Territories. Under the 1964-65 Winter House Building Program, no applications have as yet been submitted from the Yukon Territory but 15 have been submitted from the Northwest Territories.

Plans for 1965

Normal operations, with some expansion in training services.

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

GEOGRAPHICAL BRANCH

Responsibilities

Obtaining data, through field investigation and compilation, on physical, economic, and social (including urban) geography. Preparing suitable maps and explanatory reports, describing and interpreting these geographical phenomena. Assisting in other phases of planning and development through the provision of fundamental geographical data, including the investigation of questions of geographical nomenclature in the North.

Long-term Plans

To complete preliminary reconnaissance terrain mapping by areas according to the National Topographic System, bearing in mind the constant need for more detailed investigations in areas of economic importance. Prerequisites of this objective include the solution of problems associated with cartographic portrayal of surface conditions and the build-up of skills in detailed air photo interpretation. These problems are being tackled by conducting detailed, long-term field investigations in specific areas, such as Ellef Ringnes, Meighen, and Baffin Islands, and the Mackenzie River Basin. Experimentation in precise geomorphological mapping is underway, and the detailed study of problems in physical geography, concentrating on glaciology, hydrology, and landscape evolution, is being undertaken, both as a justified objective in itself, and as a means towards future extrapolation to cover large areas on a reconnaissance basis.

To complete the mapping and interpretation of data on the distribution of ice in Canadian waters; to conduct a full appraisal of break-up and freeze-up conditions in Canadian rivers and lakes; to complete a study of the distribution and regime of glaciers and ice caps.

To complete a study of northern settlements and site factors and additional aspects of the economic and human geography of the North.

Review of 1964 Operations

Field studies were continued in the Mackenzie Delta, with emphasis being placed on hydrological conditions, ground ice sheets, and the geomorphic aspects of river erosion.

Studies in geomorphology, glaciology, hydrology, and botany were extended on Baffin Island with concentration on and around the margin of the Barnes Ice Cap, and in the eastern fiord district between Ekalugad and Sam Ford fiords. Preliminary survey was made of glaciers and melt-water streams issuing from them preparatory to selection of specific localities for long-term investigation as part of the program for the International Hydrological Decade.

An airborne survey of sea ice conditions, initiated in 1961, was continued in the Queen Elizabeth Islands. This work was part of the Polar Continental Shelf Project, and was carried out from bases at Isachsen and Resolute.

Investigation was completed for 55 new place names and 83 contentious names in conjunction with 86 new maps and charts and 79 general submissions. Some 2200 previously approved names were reviewed for orthography and application.

Plans for 1965

Twenty-five geographers and assistants will further extend the field program in north-central and eastern Baffin Island. Glaciological studies, in part related to the International Hydrological Decade program, will begin in late April and geomorphological and hydrological work will begin in June. Detailed study will be made of the inter-relations between glacial features and marine submergence along the fiords of the east coast. Collection of cores from the bottom sediments of small lakes from slightly above the marine limit down to present sea level will be made for evaluation of the salt/fresh water sedimentation record.

Three geographers will undertake detailed geomorphological and hydrological studies in the Mackenzie Delta. Airborne studies of the break-up pattern will also be made. The airborne sea ice survey of Polar Continental Shelf Project area will continue.

GEOLOGICAL SURVEY OF CANADA

Responsibilities To describe and interpret by means of appropriate reports and maps, the geology of bedrock and un-consolidated deposits, including those under the continental seas; to investigate and assess mineral resources and the geological factors affecting their formation, discovery, and development; to provide fundamental geological data for engineering and water-supply projects and other factors affecting land use; and to make contributions to the science of geology, including geophysics and geochemistry.

Long-term Plans

Highest priority during the past decade has been given to the preliminary reconnaissance study and mapping of the Yukon Territory and Northwest Territories. More than 75 per cent of the north has now been covered on reconnaissance scales (1 inch to 8 miles, and 4 miles) and the effort devoted to this work will now decline gradually until its completion some ten years hence. This reconnaissance has gone far towards meeting the immediate demands of the mining and petroleum industries for general information on remote areas, and permits preliminary estimates of mineral potentials.

The effort devoted to the detailed study of critical areas and problems disclosed by the reconnaissance work, and to investigations of mineral areas, is expected to increase sharply during the next few years, particularly in the Yukon Territory and the District of Mackenzie.

Aeromagnetic Surveys made by or for the Geological Survey are primarily a supplementary method of obtaining reconnaissance geological data. As a result of an \$18 million cooperative program of aeromagnetic surveying started in 1961, it is expected that an aeromagnetic survey of the Canadian Shield in the Northwest Territories, and currently amenable parts of the Yukon, will be completed within about a decade. The surveys are being made by contracts with commercial survey companies. Experimental surveys now under way in British Columbia are developing practicable and reasonably economic ways of making aeromagnetic surveys of mountainous terrain and thus make additional areas of Yukon and perhaps of the eastern and northeastern Shield amenable to these surveys.

The 8-mile geological reconnaissance of the District of Franklin north and west of Baffin Island was completed by the end of the 1964 field season. A helicopter-supported reconnaissance of the northwest part of Baffin Island has been completed and three other such projects will follow, commencing at the south end of the island in 1965, with the object of completing the initial survey of the island, and of the District of Franklin, within the decade or shortly thereafter. As a follow-up to the initial 8-mile reconnaissance, the 2-mile mapping and study of the Bathurst and adjacent islands started in 1963, will be continued by similar investigations of other critical areas and by stratigraphic-palaeontological studies required to solve specific problems. Aero-magnetic surveys, and studies of the marine geology of the north-western continental shelf and adjacent channels, will keep pace with the Polar Continental Shelf Project as the centre of that effort moves southwesterly from Isachsen. It is unlikely that the general level of Geological Survey activity in the Arctic Islands, except Baffin Island, will increase significantly in the next few years.

Review of 1964 Operations

Seventeen parties spent the entire field season in Yukon Territory or Northwest Territories, and four others spent part of the season. The results of their work have been outlined in Geological Survey of Canada Paper 65 - 1, released 22 January 1965.

In the District of Franklin, one party completed reconnaissance geological investigations of two map-areas in the southwestern part of Baffin Island. The area contains low-grade magnetite deposits and a type of metamorphic rock used by the Eskimo for carving. Another party completed the initial stage of a two-year study of the stratigraphy and structural geology of Bathurst Island, from which a much better understanding of the geological succession and history in this region is emerging. At the same time another party undertook studies of the surficial deposits on this island, as well as on several smaller adjoining islands, from which information is forthcoming on glacial events and post-glacial marine submergence of parts of the island. Radiocarbon age determinations on shells and peat reveal that much of the island was ice-free by 9,000 years ago. A party carried out reconnaissance investigations of Pennsylvanian and Permian rocks in the Parry Islands Group, recognizing many types of rocks, their lateral continuity over many miles, and their mutual relationships and relative ages. Another party studied Lower Triassic asphaltic sandstones on northwestern Melville Island, and the resulting detailed work has led to new conclusions regarding the controls and origin of these rocks.

Three parties spent part of the summer working in the District of Franklin, one making a brief reconnaissance of surficial deposits in the western Queen Elizabeth Islands, the other two continuing marine geology investigations of the bottom sediments and certain marine fauna on the Arctic Continental Shelf at the northwestern part of the Queen Elizabeth Islands. These two marine geology projects were aided by the Polar Continental Shelf Project. Results to date indicate that the inner part of the continental shelf in this region is a drowned area of relief that was formed under conditions of normal fluvial erosion prior to Pleistocene valley glaciation. An aeromagnetic survey was completed over part of the Polar Shelf and Sverdrup Basin under contract with Canadian Aero Service Ltd.

In the District of Keewatin the main Geological Survey activity centred on Operation Wager, comprising two helicopters, a fixed-wing aircraft, and several Survey geologists, whose task was the reconnaissance geological examination of about 55,000 square miles of the northeastern District of Keewatin and of Melville Peninsula. Showings of sulphides and several bodies of iron formation were discovered during the summer. A glacial geologist attached to this party studied glacial landforms and features, recognizing a very extensive end moraine marking a former ice front along the west side of Melville Peninsula, and an upper limit of post-glacial marine invasion of the region at approximately 485 feet above present sea level. Another party completed field studies in the Kognak River area for publication at a scale of 1 inch to 4 miles. All rocks in this region are of Precambrian age. Some narrow bands of iron formation were observed within some of the sedimentary units. An aeromagnetic survey of the southeastern part of Keewatin was completed as a contracted project.

In the District of Mackenzie a party commenced reconnaissance studies of the Point Lake area north of Yellowknife, an area containing an intimate mixture of metamorphic and granitic rocks, all of Precambrian age. Another party commenced a two-year study of the stratigraphy and structure of a group of Lower Proterozoic sediments in the Rocknest Lake area. This study arose from the recognition of areas of special geological interest following Operation Coppermine in 1959. A third party commenced detailed geological examination of Precambrian metamorphosed sedimentary rocks in the Contwoyto Lake area northeast of Yellowknife, an area containing several gold showings. An engineering geologist from the Geological Survey continued investigations of dam sites in the north, in cooperation with the Water Resources Branch of the Department of Northern Affairs and National Resources.

Five potential hydro-electric power dam sites were examined, on Caribou and Flat Rivers, which form part of the Mackenzie River drainage system, and two potential power dam sites in Yukon Territory, one on Pelly River, the other on Lapie River, forming part of the Yukon River drainage system. This geologist found asbestos-bearing ultrabasic rocks on Pelly River.

In Yukon Territory a major helicopter-supported party commenced and completed a geochemical and heavy mineral investigation in the Keno Hill area (known as "Operation Keno"), over an area of 1,900 square miles. The study has shown that sampling of stream waters and sediments is a practical and helpful prospecting tool in this area. Preliminary maps showing the results of the field tests will be published by the Geological Survey early in 1965. A second party studied, for publication at a scale of 1 inch to 1 mile, two areas comprising 1,055 square miles, lying immediately west and northwest of Keno Hill. Several interesting stratigraphic and structural interpretations have resulted from this work. Another party commenced detailed geological examination of Tombstone River map-area, west of Keno Hill. This area contains a sequence of unmetamorphosed sedimentary rocks and two syenite stocks. Evidence of mineralization was noted at several localities, but no economic deposits were found. Another Geological Survey party investigated the surficial deposits in central Yukon, in particular studying deeply weathered glacial gravels in Tintina Trench and in the Stewart River valley west of the trench. This party discovered a new occurrence of fossil mammal bones on the Stewart River. Late in July three Survey geologists spent ten days checking critical parts of the Pelly River area, with the aid of a helicopter placed at their disposal by the Department of Northern Affairs and National Resources. The results of these few days' studies will be incorporated in the final report on Operation Pelly now being prepared by these three geologists. A geophysical party collected rock samples from the Laberge and Whitehorse regions for paleomagnetic studies, in order to refine the polar wandering curve and to provide data for stratigraphic correlations of certain Mesozoic, Tertiary, and Quaternary strata. An aeromagnetic survey, under contract with the Geological Survey, was made in southwestern Yukon as part of the Survey's recently increased effort to encourage and support mineral exploration in the Yukon.

Plans for 1965

Some 19 field parties are planned for the Yukon and Northwest Territories. Four parties will be in the Franklin District, three in the Keewatin District and five in the Mackenzie. Three will be in Yukon Territory. In addition, four parties will operate in more than one of the Territories or Districts.

In the District of Franklin, a party with helicopter and fixed-wing aircraft support will undertake Operation Amadjuak, a reconnaissance investigation of southern Baffin Island. This project is being carried out at the request of the Department of Northern Affairs and National Resources, as an aid in surveying economic resources in the Frobisher region. Field work will include both bedrock and surficial geology studies. A party will return to Bathurst Island to examine selected locations where previous work had indicated special problems in stratigraphy and structure. Another party will conduct reconnaissance investigations on northeastern Ellesmere Island, to provide more detailed information on this part of a major structurally deformed belt of rocks. It will be assisted by a small helicopter. One of the Survey's Arctic specialists will commence stratigraphical and palaeontological studies on Cornwallis Island aimed at ascertaining the oil and gas potential of this area. He will be supported by a Piper Cub aircraft. A palaeontologist will spend two weeks near Frobisher Bay during the summer studying the Ordovician strata and and collecting fossils from them for correlation and dating purposes.

In the District of Keewatin a geophysical party will undertake to obtain a seismic profile across Hudson Bay from Churchill to the Ottawa Islands, in cooperation with the Bedford Institute of Oceanography, the Dominion Observatory, the National Aeronautical Establishment, and Dalhousie University. Another geophysical party will be involved in an aeromagnetic survey over part of Hudson Bay, using National Aeronautical Establishment aircraft. Much of southeastern Keewatin will also undergo an aeromagnetic survey, under contract with the Geological Survey. This will cover the terrain immediately north of the area flown in 1964. It is also expected that a marine geologist will commence studies in the Hudson Bay region. A field party will continue stratigraphic investigations of the Dubawnt Group of sedimentary and volcanic rocks in the Districts of Keewatin and Mackenzie.

In the District of Mackenzie, one party will continue detailed geological studies of the active gold area around Contwoyto Lake, northeast of Yellowknife, and a second party will continue reconnaissance studies a few miles to the west. A party will work in the Rocknest Lake region, continuing its examination of critical geological areas recognized on Operation Coppermine in 1959.

A party will commence detailed studies of stratigraphic problems in the Thekulthili Lake area, east of Great Slave Lake, and the resident geologist at Yellowknife is expected to commence detailed investigations in the Port Radium uranium-silver region to lead to publication of detailed geological maps and a report, incorporating much unpublished data obtained some 20 years ago.

A helicopter-supported operation will commence reconnaissance studies in about 27,000 square miles of southeastern Yukon and southwestern Mackenzie, and adjoining parts of British Columbia. Another party will commence Pleistocene stratigraphy studies of the Mackenzie delta region and adjacent Arctic Coastal areas between Cape Bathurst and the Yukon-Alaska boundary. It will use a fixed-wing aircraft for part of its operations. An engineering geologist will continue the examination of potential power dam sites in Yukon and Mackenzie, part of a long-range program in conjunction with the Department of Northern Affairs and National Resources.

In Yukon Territory a party will commence a regional structural study to provide criteria helpful in the search for additional ore deposits in the Keno Hill region. Another party is expected to complete detailed investigations in the Tombstone region northeast of Dawson, the results of which are being used for a doctoral thesis. This project will be supervised by the resident geologist at Whitehorse. Detailed geological work will be commenced in the active mineral area around Nansen Creek. Part of the area in southwestern Yukon not covered by the 1964 aeromagnetic survey owing to poor flying weather is to be completed in 1965, and an additional area will be flown. Both of these are contract projects.

INTERDEPARTMENTAL COMMITTEE ON AIR SURVEYS

Responsibilities To receive from all federal government services requests for air surveys, and to prepare programs of air survey priorities; to issue technical instructions for carrying out such programs, and to co-ordinate the activities of commercial and government air survey organizations.

Long-term Plans

The Arctic Islands and all the mainland of Canada, except for about 2,000 square miles southeast of Ungava Bay, are now covered with vertical air photography for small scale mapping. Additional mapping photography and photography of special areas for development, scientific investigations, or large scale mapping will be provided.

Review of 1964 Operations

Poor photographic weather prevented completion of the southeast Yukon and southwest Northwest Territories, and the new contracts in the Peel River and Arctic Red River areas, and a large area on the west coast of Hudson Bay above Churchill.

Good progress was made in the southeast Ungava area and in the Mackenzie Highway (northern Alberta) area.

The following northern areas were photographed:

1. Mackenzie Highway (northern Alberta)
2. Resolute
3. Sachs Harbour
4. Cape Perry
5. Kusawa Lake
6. Inuvik
7. Yellowknife
8. Kakisa Crossing
9. Churchill

Plans for 1965

It is hoped that all areas not completed in 1964 will be photographed in 1965.

Up-to-date photography will undertaken of the Northwest Territories coastal area east of the Mackenzie River, an area in the Yukon north of Whitehorse, two areas in Baffin Island, Frobisher Bay, and smaller areas of Port Burwell, George River, and Deception Bay. Photography is also planned for Milne Inlet in northern Baffin Island.

MARINE SCIENCES BRANCH

Responsibilities To carry out hydrographic and oceanographic surveys in Arctic waters.

To produce and distribute charts, mailing directions, tide tables, and reports based on survey activities and on information from all sources.

To carry out research on the oceanography of the region.

Long-term Plans

To complete standard hydrographic surveys of the Arctic coast as soon as possible, and to continue the publication and maintenance of up-to-date charts of the region. To carry out reconnaissance surveys where requirements exist for charting ahead of the regular surveys. To maintain reliable sailing directions as published in the Pilot of Arctic Canada. To establish and maintain a network of gauging stations to meet the needs of scientific research. To carry out oceanographic and current surveys to meet general scientific requirements including those of defence. To improve steadily the capability to carry out fundamental research on Arctic oceanography and the means to conduct observations in the region.

Review of 1964 Operations

Oceanography

Eastern Arctic

Oceanographers from the Bedford Institute of Oceanography and the United States Navy Oceanographic Office conducted a survey in Nares Strait, Baffin Bay, and in the Labrador Sea, from CCGS "Labrador."

An excellent series of stations including cores and several large water samples for radiochemical analyses were taken in the area to a position in the southern end of Robeson Channel at $81^{\circ}45'$ north. Attempts were made to complete the magnetometer surveys begun in 1963 in Smith Sound, but this program was abandoned owing to ice, and an alternate magnetometer survey was run in the eastern end of Lancaster Sound. Approximately 1600 line miles were surveyed with a magnetometer in the Baffin Bay - Lancaster Sound area.

A series of oceanographic stations was taken in northern Baffin Bay and in the deep areas with special observations at the bottom and through the intermediate temperature maximum. These observations were continued through the Labrador Sea to Belle Isle for the annual ice forecasts of the United States Navy Oceanographic Office.

Biological samples were collected at key stations for the Fisheries Research Board.

Western Arctic

During the period January - March a very complete study was made of the natural heat flow through the sea ice cover at Cambridge Bay, but experiments on the measurements of the enhanced heat flow caused by a bubbler system had to be abandoned owing to problems encountered with an air compressor.

The results for temperature distribution and heat flow through the ice extend over a period of 664 hours. These data are currently being analysed and the results have been most encouraging.

Measurements of ice thicknesses have shown surprisingly large variations in thickness, of the order of one foot in six feet over a 20' horizontal distance. This has been interpreted as being related to convective overturn processes occurring under an ice sheet.

Ten Canadian and two United States oceanographers participated in these programs.

Hydrography

The operations of C.S.S. Richardson in Western Arctic were badly hindered by heavy ice, confining her activities to the area between Tuktoyaktuk and Cape Bathurst. The main project was a survey of Kugmallit Bay and its approaches, using radar transponder beacons. A launch party made a reconnaissance survey of the Mackenzie River from Fort Providence to Norman Wells to enable charts to be published using a small boat format. Work also was continued on the standard survey of the river entrance in the vicinity of Pointe Desmarais.

Hydrographers were assigned to three Canadian Coast Guard icebreakers in the Eastern Arctic. The westward probe by CCGS John A. Macdonald was halted by heavy ice at Winter Harbour. A total of 5,168 miles of track soundings were gathered and small launch surveys were conducted in Adams Sound, the approaches to Pangnirtung, and Sorry Harbour. CCGS d'Iberville carried out extensive reconnaissance soundings in Milne Inlet and Cumberland Sound and made a small survey in the approach to Resolute Bay.

Two hydrographers were assigned to CCGS Labrador for the early part of the summer and established control to enable Akpatok Island to be mapped in its correct geographic relationship to the mainland.

Three hydrographers were assigned to the Polar Shelf Project. Poor weather allowed only a small amount of progress on the reconnaissance sounding over the continental shelf and in Hazen Strait. The detailed survey of Fram Sound, which forms the Southern approaches to Hell Gate and Cardigan Strait, was completed using helicopters and hi-fix. A special survey was made of the landing beach at Hall Beach by two hydrographers.

Tide gauges were maintained at Churchill, Frobisher, Resolute, Alert, Tuktoyaktuk, and Cambridge Bay.

Three new hydrographic charts, seven new editions, and twenty-six supplementary ozalid prints were issued. Supplements were issued to the three volumes of the Arctic Pilot. For the first time standard Tide Tables for "Hudson Bay and Arctic Waters" were issued.

Plans for 1965

Oceanography

An extensive geological and geophysical survey of Hudson Bay is planned in 1965 employing CSS "Hudson" and a charter ship. Co-operating agencies include the Geological Survey of Canada, the Dominion Observatory, the Fisheries Research Board, and possibly a number of Canadian universities which have shown an interest in crustal studies. The Hudson Bay program will likely mark the most intensive geological and geophysical studies yet undertaken in arctic waters.

It is expected that Eastern Arctic observations will be furthered through the allocation of time in Department of Transport icebreakers. A program is under consideration now to continue the studies on the magnetics and deep water of Baffin Bay, participating as well with the United States Navy on the occupation of the same network of ice forecast stations as in 1964.

The Frozen Sea Research group is presently conducting studies in the Cambridge Bay area furthering their program of last year with improved instrumentation and vehicles.

Hydrography

Hydrographers will be assigned to C.S.S. Hudson to take part in the geophysical survey of Hudson Bay. A launch party for this ship will resurvey Churchill Harbour and its immediate approaches. C.S.S. Richardson will continue her survey of the approaches to Tuktoyaktuk and will survey Holman and Coppermine River.

Two Canadian Coast Guard icebreakers will be used for hydrographic surveys. In the Eastern Arctic they will concentrate on Milne Inlet and its approaches. In the Western Arctic C.S.S. Camsell will survey Perry River settlement and carry out other surveys as opportunity permits.

New permanent tide gauges will be established at Port Harrison, Churchill Harbour, and Cape Parry, and the six existing gauges will be serviced.

MINES BRANCH

Responsibilities Technical assistance for the development of mining and metallurgical industries in the North and for the development and utilization of petroleum and natural gas resources. Consulting advice and investigations on metals, metallic and non-metallic minerals, fuels, petroleum, natural gas, and industrial waters as related to northern development.

Long-term Plans

To continue technical assistance in developing mineral, petroleum, and natural gas resources in co-operation with industry, the Department of Northern Affairs and National Resources, and other branches of government.

Review of 1964 Operations

Metallic Ores

An investigation was commenced on January 9, on a gold ore from Ormsby mines Ltd., Carmacks, Yukon, at the request of Discovery Mines Ltd. Mines Branch Investigation Report IR 64-52 was issued June 1. A flowsheet was recommended by which the greater part of the gold would be recovered by gravity concentration (jigging) at a coarse grind from the ball mill circulating load, followed by fine grinding and cyanidation to obtain a final overall recovery of 98-99%. A major problem was the high clay content of the ore which required the development of special thickening, clarifying, and filtering procedures before a feasible treatment scheme was recommended. An alternative scheme to reduce capital expenditure using flotation and cyanidation, but with a slightly lower recovery, was also developed for the company's consideration.

Work on a copper-iron ore from New Imperial Mines Ltd., Whitehorse, began in April. A copper flotation concentrate of good grade was produced with recoveries of copper, gold, and silver approaching 90%. The removal of traces of copper to an acceptable level in the iron (magnetite) concentrate was particularly difficult, but a procedure has been developed to solve this problem. A final recommendation is being prepared and a report will be issued.

An investigation was begun in November, on an antimony ore from Yukon Antimony Corporation Ltd. Only preliminary results have been reported as the test work is slowed by delays in analysis of test samples. Little progress was made on the investigation of a copper-zinc-silver ore from Northwest Explorers Ltd., Great Bear Lake Area. The company was asked for samples of mineable ore when the preliminary investigation revealed that the original sample was not representative. Separation of silver and base metal (Cu, Zn) concentrates is a very difficult problem with choice of method and grade of product highly dependent upon transportation and costs in the Far North. Therefore a representative sample of mine grade ore is required.

Work at the Mines Branch on the iron ore of Crest Exploration Ltd., Snake River, Y. T., was limited to an investigation to lower the phosphorus content of the jig concentrates made in 1963 and the investigation of alternatives to jig treatment for primary concentration. Heavy-media cyclone treatment appears promising as an alternative to jiggling although operating costs would be higher. Removal of phosphorus from the concentrates is still a problem. Consulting advice and assistance is still being given to Crest in co-ordinating the results of special test work at the U.S. Bureau of Mines and other establishments.

Work was started on an iron ore from Pacific Giant Steel Ores Ltd., Wind River, with the receipt of the first exploration samples in December.

At the request of the Geological Survey of Canada Branch tests were made on seven samples from Melville Peninsula Iron Formation, to determine the concentration characteristics of this material. Tests were made in November and the results of analysis are not yet available. Some of the samples appeared to give a good yield of concentrate but grade is as yet unknown.

After a suspension of operations in July, 1963, owing to depressed tungsten mineral markets, Canada Tungsten Mines Ltd., started operating again in July, 1964. Laboratory scale process studies begun at the end of 1963, with the object of developing economic methods of producing high purity products from this Canadian ore, have shown the feasibility of extracting the tungsten efficiently and economically by a two-stage acidcaustic leach. Currently, the work is directed towards the recovery of the leached tungsten by ion-exchange methods with the object of producing tungstic anhydride for reduction to high purity tungsten metal.

The mill superintendents of the gold mills using the cyanide process, which include three mills in the Northwest Territories, were invited to take part in an industry-wide technical meeting held at the Mines Branch in January, to discuss research and operations aspects of cyanide leach plant metallurgy.

Non-Metallic Minerals

Samples of industrial minerals originating in the north were examined during the year. A sample of silica sand from the western shore of Great Slave Lake submitted by the Resident Geologist at Yellowknife proved to be of exceptional purity. Although the sand is remote from markets, some preliminary work is being carried out to determine the purity of the final product. Samples of clays from the Yellowknife area were also investigated.

Industrial Waters

A five-year program of sampling and analysis of the Mackenzie and Yukon Rivers was continued into the fifth year. Samples of surface and groundwaters were analysed for the Geological Survey of Canada. Samples of water from northern islands were analysed for the Arctic Unit, Fisheries Research Board of Canada, and to assist the Department of Agriculture in a research study on the ecology of aquatic organisms. A total of 565 waters were analysed to assist in geochemical studies in relation to copper-zinc deposits in the Keno-Yukon area. A report is being prepared on the chemical quality of waters (apart from drainage basins) in the Arctic Islands and the Northwest Territories.

Mineralogical Studies

During the year the mineralogy of products from the test treatment of a tungsten ore in the Flat River Area and a gold ore at Yellowknife in the Northwest Territories was investigated. The studies involving deposits in Yukon Territory were somewhat varied. These included the investigation of specimens of copper ore from the Whitehorse Copper Belt, of antimony-bearing material from Carbon Hill on the Wheaton River, and from two deposits of iron ore, one in the Snake River area (Crest Exploration Limited) and the other about one hundred miles north-east of Mayo (Pacific Giant Steel Ores Limited). In addition to these, a rather more comprehensive study was made of the silver-bearing ores in the vicinity of Galena Hill and Keno Hill in connection with a criminal case now before the Yukon Territorial court.

Chemical Analyses

Analyses were made on 12 samples for a total of 49 determinations. These samples were submitted by officers of the Geological Survey of Canada.

The Use of Carbon - and Low-Alloy Steels at Low Temperatures

Work on nickel-vanadium cast steel icebreaker propellers was continued. A series of test castings was prepared to allow determination of the effect of composition variables on the nil ductility temperatures (NDT). This project was undertaken to evaluate the significance of deviation of analysis within the specified range and to determine the effect of change of nickel content, vanadium, manganese, and silicon content at two levels. The Charpy V-notch data were also obtained from these experimental castings at temperatures of -80°F to $+200^{\circ}\text{F}$ in an attempt to relate nil ductility temperature to the more commonly used Charpy V-notch impact test. During the last quarter, work commenced on the research program in co-operation with the Quebec North Shore and Labrador Railway Co. with the object of determining the reason for differences in rate of wear of steel rail used for iron ore haulage under severe conditions of low temperatures, difficult terrain, and heavy loading. A preliminary examination of typical selected rail defects such as "shells", "spalls", head checks, and corrugations is being made as a possible first step in a more detailed study of rail defects - particularly as these are affected by northern service and high wheel loads.

Work has been continued on the welding of structural steels at temperatures down to -60°F . A report is available on some of the more recent investigations.

Some work has been commenced on the weldability and notch ductility of steel to Canadian Standard Association G40.8 Grade B using electrogas welding. This steel is intended for service at low ambient temperatures. The electrogas welding process, new to Canada, may have some advantages for joining in cold weather.

Facilities, unique in Canada, have been set up for explosion-bulge testing, which is important for the evaluation of the notch-ductility of steels for low-temperature service.

Fuels

One sample of mine air from Discovery Mine, was analysed. Twenty-two samples of bituminous sands from Melville Island were submitted

by the Geological Survey for evaluation of the bitumen. Three samples of limestone from the Yukon Territory were submitted for determining the hydrocarbon content.

Plans for 1965

Technical and scientific services will be provided for assisting in the opening of new mines, for increasing mineral production in the Territories, and for solving production problems of petroleum and natural gas. Scientific advice will be available and investigations will be undertaken as required on northern problems related to metals, minerals, fuels, petroleum, natural gas, and industrial waters. Specific projects include the continuation of the long range sampling program on the quality of waters in northern rivers, investigations to improve marketability of Crest iron ore concentrate, and provision of expert witnesses regarding the alleged theft from the Keno Hill area.

OBSERVATORIES BRANCH

Responsibilities

The Seismological Division operates seismic observatories at Alert, Mould Bay, Resolute, Coppermine, Frobisher, Yellowknife, and Schefferville, and co-operates with the United Kingdom in the operating of a large seismic array near Yellowknife.

The Gravity Division obtains gravity data for use in geodetic research problems and for studies of regional as well as localized crustal features. Gravity data are used in geodetic research to assist in determining the size and shape of the earth and are currently of interest to the Department of National Defence in connection with the problem of long range rocket and missile trajectories. Gravity data with interpretations are provided as a service to the oil and mining exploration industries.

The Geomagnetic Division measures and charts the magnetic field, operates a network of magnetic observatories, and conducts research into the structure of the crust by geomagnetic methods.

Long-term Plans

To construct seismograph stations at Whitehorse, Hall Lake or alternate, and Churchill, and to instrument and commission the newly constructed vaults at Baker Lake and Great Whale River; to investigate other seismic recording techniques in order to facilitate scientific analysis, and to study problems in Arctic seismicity with experimental temporary installations.

Within the next decade, to complete regional gravity coverage at a station spacing of 6 to 8 miles over most of the northern areas of Canada including the inter-island channels of the Arctic Archipelago and large part of the Polar Continental Shelf, and where possible, to investigate local anomalous areas in detail.

To reoccupy magnetic repeat stations at 3 to 5 year intervals; to carry out three-component airborne magnetic surveys at 5 to 10 year intervals; to operate permanent and temporary magnetic observatories.

Review of 1964 Operations

The seismic observatories at Mould Bay, Alert, Resolute, Coppermine, Schefferville and Frobisher operated continuously, as did the seismic array at Yellowknife. The seismic vault at Yellowknife was brought into service and new seismic vaults were constructed at Baker Lake and Great Whale River.

In connection with the Polar Shelf Project approximately 500 gravity stations were established on the sea ice between Brock, Melville and Bathurst Islands and northwest over the continental shelf to a distance of 150 miles. In the area bounded by latitude 60 and 68° N and by longitude 103° W and the west coast of Hudson Bay, 180 gravity stations were established by means of a Beaver aircraft. Using a helicopter from the icebreaker N.B. McLean, 120 stations were observed on Coats Island, Nottingham Island, and the south central part of Southampton Island. All accessible roads in the Yukon Territory were traversed by car and gravity readings taken at 180 bench marks at six mile intervals. The gravity control station network was greatly strengthened by an observer taking advantage of the Polar Shelf fixed wing support aircraft and accompanying a party doing a magnetic survey at settlements in the Hudson Strait area.

Fourteen magnetic stations were occupied to determine secular change in the Foxe Basin area, including Baffin Island, Melville Peninsula, and Southampton Island. Magnetic observatories operated continuously at Resolute Bay, Mould Bay, Alert, and Baker Lake. Three temporary magnetic observatories were operated on Melville Island on a line between Mould Bay and Resolute to investigate further the anomalous induction in the crust under Mould Bay. As part of the same study, three measurements of heat flow were made in M'Clure Strait between Prince Patrick and Banks Island, operating from the sea ice.

Plans for 1965

The seismology program will be continued.

Regional gravity mapping will be continued in the Polar Shelf area on the islands, on the ice between the islands and on the ice of the shelf itself. A special effort is planned to get a gravity and hydrographic traverse out beyond the limits of the shelf to the basin of the Arctic Ocean. During the open season in Hudson Bay an extensive survey of gravity measurements will be made by lowering gravimeters to the bottom from ships of the Marine Sciences Branch.

In March a party headed by Dr. J.R. Weber will continue the quantitative study of the Penny Ice Cap begun in 1962. Seismic, radar altimetry, electrical resistance, gravity, and geodetic survey methods will be used. A major regional survey employing two helicopters and a fixed wing aircraft will map the gravity field over a 250,000 square mile area in Northern Manitoba, northwestern Ontario, and northeastern Saskatchewan. Gravity connections between the airports and the settlements in the north will be strengthened and regional control established as usual for the regional surveys both in the north and in Manitoba.

Nine magnetic stations in the District of Mackenzie and Victoria Island will be reoccupied. Additional magneto-telluric measurements will be made on Cornwallis Island and heat flow determinations in Viscount Melville Sound.

POLAR CONTINENTAL SHELF PROJECT

Responsibilities

To carry out a long-term investigation of the continental shelf lying to the north and west of the Canadian Arctic Archipelago and of the waters above it, together with the islands of the archipelago where relevant, and the straits and sounds between the islands. The investigation is to comprise mainly those fields of survey and subjects of research for which the Department of Mines and Technical Surveys is responsible in other parts of Canada, wherever such study is not more economically and efficiently pursued as a separate self-contained operation; but it is also designed to include or to support worthwhile researches in fields outside those normally supported by the Department, if such researches could not otherwise be carried out.

Long-term Plans

The field survey and research phases of the Project will eventually cover all the Canadian sector of the Arctic continental shelf of North America, those parts of the Arctic Ocean basin that are of interest to Canadian investigators and which can be reached with available logistics resources, and all parts of the Arctic Archipelago not investigated by other agencies in the particular fields of interest covered by the Project. From 1959 to 1963 work has been concentrated in the region between Meighen Island and Brock Island, extending about 200 kilometres out to sea and the same distance back into the archipelago; but individual programmes of survey research have been carried out throughout all the Queen Elizabeth Islands, and extended to Banks Island in the southwest and northern Greenland in the northeast. As the area of intensive systematic survey moves to the southwest along the Arctic Ocean front, at a rate of about 150 kilometres per year, it is expected that a greater portion of the specialized researches will be carried out at widely separate places throughout the region, in whatever locality the problem is best studied. The Project therefore will expect to maintain a central base of operations in the field, scattered sub-bases as necessary, and an extensive logistics and communications system, ranging throughout the Archipelago and adjacent ocean, to support widely scattered activities.

Review of 1964 Operations

Field work was co-ordinated mainly from Mould Bay, on Prince Patrick Island. Parties totalling 91 persons were engaged in investigating the central section of the arctic continental shelf and the adjacent islands and straits. A further 54 persons were employed in supporting roles connected with transport.

The 1964 season was one of restricted operations, compared to previous seasons, owing to remarkably heavy sea ice offshore from Prince Patrick Island in the spring, which frustrated the oceanic programme, and to unusually prolonged periods of bad weather over the archipelago in mid and late summer, which resulted in the greatest proportion of "non-flyable" days in any season since the operation began in 1959.

In addition to the Department of Mines and Technical Surveys, the following agencies were involved in the 1964 programme:

Department of National Defence (Defence Research Board)
The National Museum of Canada
Dartmouth College
University of Massachusetts
McGill University
University of New Brunswick
University of Ottawa
Rutgers University
University of Washington
U.S. Army Cold Regions Research and Engineering Laboratories

One commercial company, Hunting Technical Surveys, also made direct use of the Polar Continental Shelf Project field survey facilities, under an approved arrangement, in connection with its own programme of investigations.

The following is a summary of the work done in the major scientific fields:

Aeromagnetic Survey

As a continuation of the programme of regional aeromagnetic mapping of Canada by the Geological Survey of Canada, a survey of the total-intensity magnetic field was made along 53,000 kilometers of flight path, covering an area of approximately 110,000 square kilometers of the continental shelf offshore from Brock and northern Prince Patrick Islands and of the west-central part of the Parry Islands.

The positions of the magnetic observations were controlled by the Polar Continental Shelf Project Decca Lambda navigation chain. The maps are being compiled for publication on a scale of 1:126,720.

Geology, Marine

The programme in submarine geology has been designed to provide information on the character and stratigraphy of the sediments on the floor of the seas surrounding the islands of the archipelago, and covering the continental shelf. One party collected cores and bottom samples and studied the sea-bottom morphology on Arctic continental shelf offshore from Borden Island to southwestern Prince Patrick Island, and another party carried out detailed bottom sampling of an inshore area near northwestern Prince Patrick Island.

Geology, Terrestrial

The Polar Continental Shelf Project provided certain logistic support and field facilities to parties of the Geological Survey of Canada (q.v.) engaged in a study of the Arctic Coastal Plain and of the sedimentary formations on the islands. Field support was also provided to university parties studying geology on Victoria Island and Somerset Island.

Geomagnetism

The anomaly in magnetic conductivity in the Mould Bay region was further investigated with the establishment of geomagnetic field stations on Melville Island, along a line between the Resolute and Mould Bay observatories.

Glaciology

The four icecaps on Melville Island were further surveyed and routine ablation and accumulation measurements carried out. Certain profiles on the Meighen Island icecap were re-surveyed, and the stake network measured and re-established. The thermal coring drill was completed and tested and shipped to Meighen Island, but because of transport difficulties all components did not arrive on the icecap and drilling operations did not begin. An extensive aerial photographic inventory was undertaken of all major glaciers on Axel Heiberg, Ellesmere, Devon Island, as part of the programme for the International Hydrological Decade. Logistic support was provided for a university programme on the glaciers of Axel Heiberg Island.

Gravity

The regional gravity survey was continued to cover the continental shelf and continental slope offshore from Ballantyne Strait and northwest Prince Patrick Island, and within the archipelago in the region of Fitzwilliam Strait and Hecla and Griper Bay. Base loop control was extended across Barrow Strait and over parts of Somerset Island, Peel Sound and Prince of Wales Island, and a limited amount of gravity mapping was undertaken on northern Somerset and Prince of Wales Islands. Long range gravity base loops were completed between Inuvik, Barter Island, Mould Bay, Cambridge Bay, and Resolute.

Heat Flow

The equipment for measuring the flow of geothermal heat from ocean floors was constructed and tested, and three successful heat flow stations were established in the west end of McClure Strait.

Hydrographic Survey

The bathymetric survey of the continental shelf and slope, and of the straits and sounds between the western Queen Elizabeth Islands was continued, with through-the-ice sounding on a grid spacing of 7 to 10 kilometres over about 30,000 square kilometres northwest and southeast of Brock Island, Ballantyne Strait, and north Prince Patrick Island. Decca Lambda position control was used. This work will be for publication on a scale of 1:500,000. The standard hydrographic survey of Cardigan Strait and approaches, for publication on a scale of 1:50,000 was continued, using helicopter-towed sounding equipment and Decca Hi-Fix control. Reconnaissance and preliminary surveys were made in the Nares Strait and Lincoln Sea area to prepare for future hydrographic surveys in that district.

Ichthyology

A party was established off the outer edge of the continental shelf northwest from central Prince Patrick Island to collect deep-water fishes from the Arctic Ocean basin.

Marine Botany

Studies were made of the marine algae beneath and within the pack ice along the coasts of Prince Patrick Island near Mould Bay.

Pedology

The development of soils under Arctic conditions was studied, and maps were made of the distribution and relation to environment of various soil types on two typical areas of the Arctic Coastal Plain of Prince Patrick Island and the lowlands of Cornwallis Island.

Sea Ice Surveys

Systematic patrols were made of all major waters of the Queen Elizabeth Islands and of the adjacent Arctic Ocean and Parry Channel, throughout the season of significant sea ice activity. Information was collected on the nature, break-up, amount, distribution, dispersal, and formation of the sea ice and certain tabular icebergs or "ice islands". It has proved possible to follow the movement of the same ice throughout the season and from year to year. The continuation of these surveys for a number of years is beginning to show the range of variations and apparently significant consistencies in sea ice nature and movement from year to year. Information is collected relating the behaviour of the ice to meteorological and oceanographic factors; this, it is hoped, will lead to a better understanding of the causes and controls of sea ice development and movement and thus, in turn, to better forecasts of ice conditions.

Seismic Surveys

Seismic refraction traverses were run from Brock Island northwest over the continental shelf, and southeast into the area of Ballantyne Strait and Hazen Strait, as part of a programme to provide information on the crustal conditions and deeper sedimentary structures under and forming the west end of the Sverdrup sedimentary basin.

Sub-Ice Acoustics

Certain logistics support and field facilities were provided for a programme of investigation of the characteristics of sound transmission in sea water beneath old polar pack ice and younger sea ice in winter conditions.

Topographic and Geodetic Surveys

Stations were selected and preliminary surveys carried out in the Robeson Channel area for a future precise survey to determine the relative movement of the Greenland and Ellesmere Island crustal blocks. Other positioning and control surveys were run as required in connection with the glaciological work on Melville Island and Meighen Island, the seismic traverses from Brock Island, and calibration of the Decca Lambda position-fixing system.

Plans for 1965

Work will be continued in all of the major activities of 1964, with the exception of aeromagnetic surveys. Minor investigations outside the direct responsibilities of the Department of Mines and Technical Surveys will be undertaken or supported as circumstances warrant.

The marine geology investigations will be directed toward obtaining cores of the sediments of the deeper parts of the continental shelf toward its outer edge.

Logistic support will be provided as appropriate to terrestrial geology studies by the Geological Survey of Canada (q. v.) and others.

The geomagnetic team will test newly-developed magnetometer and magneto-telluric instruments on Cornwallis Island.

Studies of ice physics will be continued on Meighen Island icecap, where it is hoped that a bore hole may be put through the glacier and an accurate temperature profile obtained. Glaciological measurements will continue on the Meighen Island and Melville Island icecaps.

Gravity mapping will be carried out over the continental shelf off north-western Prince Patrick Island, over some of the channels of the western Parry Islands, and over Somerset Island, Peel Sound, and part of Prince of Wales Island. Long-range gravity base loops will be run to complete the control network in the archipelago and to provide a gravity tie to offshore ice stations.

Measurements of geothermal heat flow will be continued near the ocean floor off Prince Patrick Island.

Hydrographic charting of the continental shelf off Prince Patrick Island and of the channels between Prince Patrick and Melville Islands will be continued. It is planned to complete the regular hydrographic survey of Cardigan Strait at a scale 1:50,000. Preparations will be made for a future hydrographic survey of northern Nares Strait.

A detailed magnetometer survey is planned for an area in eastern Queen Maud Gulf.

Investigations of soil formation and mass wastage processes will be undertaken on Ellef Ringnes and Prince Patrick Islands.

Systematic sea ice patrols will be run over the major channels of the archipelago and along the ocean front. The route and coverage will be similar to previous years, except that relatively more attention will be paid to some of the southern channels of the archipelago than has been done hitherto.

Seismic refraction traverses are planned to cross the west-central part of the Sverdrup sedimentary basin from Fitzwilliam Owen Island to southern Melville Island, and if feasible across Viscount Melville Sound to Victoria or Stefansson Islands.

Studies of underwater sound transmission under heavy pack ice cover in deeper waters will be continued.

Topographic control surveys will be undertaken as necessary to support the above activities. Preparations will be made for an anticipated geodetic survey across Robeson Channel in 1966.

Co-operative work may be undertaken, as appropriate and authorized, with other groups engaged in scientific studies in the area.

The field work is expected to engage a total of about 100 men, including personnel under contract and crews of supporting aircraft. Aerial transport in the field is expected to be provided by two Sikorsky S-55 helicopters, one Bell 204B and one Bell 47G2A helicopters, three deHavilland DHC-3 Otter aircraft, and one Beechcraft D18S, with larger freighting aircraft as required. Ground transport includes 6 tracked and wheel vehicles and about 12 motor toboggans and small amphibious vehicles. The central base camp will be at Mould Bay, with established or semi-permanent facilities at Resolute, Hell Gate, Meighen Island, Brock Island, and Cape Andreasen and Houghton Head on Prince Patrick Island.

SURVEYS AND MAPPING BRANCH

Responsibilities To carry out all geodetic, topographic, and legal surveys, and to produce topographical maps and aeronautical charts required for administration, development, and defence purposes.

Long-term Plans

Geodetic Control

To extend horizontal and vertical control as developments warrant and facilities permit, and to obtain data from astronomical observations for investigations of the size and shape of the earth.

Mapping

To complete topographical coverage at 1:250,000 by 1967; to provide 1:50,000 and, if necessary, larger scale mapping of major routes of travel and other areas of economic importance or development; to revise air chart bases as better information becomes available.

Aeronautical Charting

To revise the portrayal of aids to air navigation on aeronautical charts and pilots handbooks and other air information publications, and to produce new aeronautical charts as required.

Legal Surveys

To manage and execute surveys made to enable land or resource transactions involved in the administration and development of public or other lands.

Review of 1964 Operations

Geodetic Control

The triangulation arc extending from Coppermine to Cambridge Bay was completed, and a spur extended some 60 miles east from Cambridge Bay to connect existing low-order surveys.

This arc closes the large loop which runs from Great Slave Lake through Yellowknife to Coppermine, Cambridge Bay, and then south to Whitefish Lake, east of Fort Reliance. Astronomic control was established at Ross Point on Victoria Island, and observations to determine deviation of the vertical were taken at six other triangulation stations in the arc.

Topographical Mapping

Field Work

- (a) Surveys were completed by Aerodist for mapping all the small islands in James Bay and eastern Hudson Bay.
- (b) Control was established for mapping thirteen sheets at the 1/50,000 scale around Mayo.
- (c) Vertical control was completed for mapping Whitehorse at the 1/25,000 scale.
- (d) Local surveys were made for large-scale plots of settlements at Port Burwell, in the Northwest Territories and Michie Creek, Elsa, Beaver Creek, Tagish, Carmacks, and Teslin in the Yukon Territory.
- (e) Assistance was given to the Polar Continental Shelf project and the Defence Research Board in the Queen Elizabeth Islands.

Map Compilation

- (a) Sixteen sheets were completed in Baffin Island and two in Ellesmere Island for publication at the 1/250,000 scale.
- (b) Thirty-six sheets were completed for publication at the 1/50,000 scale: seven in the Hell Gate area, sixteen in the Beaver River Basin, and thirteen in the Barnes Icecap area.
- (c) Special plots were made of areas of interest on Smith Sound and Hell Gate, on Broughton and Padloping Islands, for the extension of Inuvik, and, for a creek diversion at Resolute airstrip. Preparation was completed for large-scale plots of nineteen settlement areas.

Aeronautical Charting

Aeronautical information was revised for existing aeronautical charts and publications as required for civil and military use. Topographical information was revised on one 1:500,000 chart and one 1:1,000,000 chart.

Legal Surveys

Yukon Territory - The portions of the 50-mile section of the Canol Pipe Line right-of-way between Carcross and Whitehorse lying within Crown land were monumented to effect its transfer to the White Pass and Yukon (Route) Railway. Fifty-seven of these miscellaneous parcels of land along the Alaska Highway and Haines Road were surveyed as well as a 76-lot subdivision at Beaver Creek, a 16-lot subdivision for cottage lots on Lake Laberge, and a cemetery at Whitehorse. A 2-mile section of the Alaska Highway was relocated. A field officer inspected the survey of about 1,000 iron claims in the Snake River area on the boundary of the Yukon and Northwest Territories.

Northwest Territories - A 160-lot commercial subdivision in the re-located townsite of Hay River was surveyed as well as a 47-lot addition to Snowdrift settlement and a small subdivision at Fort Providence. An airfield, a radio receiver and transmitter site were surveyed at Cambridge Bay and miscellaneous lots and rights-of-way at Fort Resolution, Snare River, Port Radium, Frank Channel, and Fort Smith. Horizontal and vertical control was obtained for the Topographical Surveys Section at Kakisa River, Pine Point, Stagg River, Fort Providence, Hay Camp, and Frank Channel. The survey of a prison site near Yellowknife and a lot in the townsite were carried out by a private survey firm under contract.

Plans for 1965

Geodetic Control

Work will be resumed on a triangulation arc from Rankin Inlet south to the provincial boundary and Churchill, Man. Astronomic control will be established along this arc. A party of four men will work with a large Topographical Survey party engaged in establishing Aerodist connections between Quebec and Baffin Island to the north, and between Quebec and Southampton Island to the west.

Topographical Mapping

Field Work

- (a) Geodetic control by Aerodist trilateration will be extended in co-operation with the Geodetic Survey across the north end of Hudson Bay and to Baffin Island. Supplementary control will be established for mapping of Coats, Mansel, Nottingham and Salisbury Islands at the 1/250,000 scale.

- (b) Control surveys will be made for mapping thirty-eight sheets at the 1/50,000 scale south of Milne Inlet, Baffin Island.
- (c) Control surveys will be made for mapping about sixty sheets at the 1/50,000 scale in central Yukon.
- (d) Assistance will be given to the Polar Continental Shelf Project.

Map Compilation

At least 35 sheets in Baffin and Ellesmere Islands at the 1/250,000 scale will be completed, together with four sheets at the 1/50,000 scale of Meighen Island, and one sheet at the 1/25,000 scale of Whitehorse. Material will be prepared for large-scale plots by contract for about twenty settlements. Special plots at a scale of 1/25,000 will be completed for the whole of Meighen Island with particular attention to the ice-cap. A special plot will be made of a glacier at Tanquary Fiord, Ellesmere Island.

Aeronautical Charting

Aeronautical information in existing aeronautical charts and publications will be revised as required. Topographical information will be revised as new large-scale mapping becomes available. A combined plotting/planning chart, covering from Alberta to Germany and extending across the north, will be produced.

Legal Surveys

Yukon Territory - Most of the surveys will be of miscellaneous lots for sale or lease or for the use of various government agencies. These number about 42 and are mostly located along the Alaska Highway, the Whitehorse - Mayo road, and the Ross River road. In addition, surveys of rights-of-way of four Alaska Highway relocations are required as well as a partial retracement of the subdivision of the town of Watson Lake. Between one-third and a half of the miscellaneous lot surveys may be done by surveyors in private practice, and the balance will be carried out by staff surveyors.

Northwest Territories - Most of the surveys are required in connection with the administration and development of towns and settlements, and lots for use of various government agencies, including the Departments of Northern Affairs and National Resources, Citizenship and Immigration, Public Works, and Transport. Five additions to the subdivisions at Inuvik and a new subdivision at Holman Island are on the program. Five parcel and right-of-way surveys are required at Inuvik and eleven miscellaneous lot surveys at Fort Simpson, Fort Norman, Fort McPherson, Nahanni Butte, Spence Bay, and Tuktoyaktuk.

Surveys of eight camp and picnic grounds have been requested at various places along the Mackenzie Highway, some of which may be done this year. Additional miscellaneous lot surveys in widely scattered locations have been requested and some of these may be undertaken by surveyors in private practice.

DEPARTMENT OF NATIONAL DEFENCE

NAVY

Responsibilities

Support of Canada's external and defence policies in the North by contributing to the maintenance of Canadian sovereignty in the Arctic and by supporting operations in Arctic waters.

Long-term Plans

To maintain close liaison with agencies investigating various defence problems in the Arctic in order that an Arctic Defence Plan may be developed further.

Review of 1964 Operations

Ship Operations

No RCN ships operated in Arctic waters in 1964.

Naval Radio Station Frobisher

In addition to normal radio activities, seasonal naval radio activities were carried out in support of DEW Line re-supply operations.

Alert Radio Station

The RCN continued to contribute personnel for the joint operation of Alert Radio Station.

Other Naval Radio Stations

Naval radio activities were carried out at Churchill and Inuvik.

Clearance Diving Teams

RCN clearance diving teams provided assistance in connection with DEW Line re-supply in the Eastern and Western Arctic. The teams were employed in clearing underwater obstructions and ice blocking approaches to landing beaches in advance and during the supply operations.

Hovercraft Trials at Cowes, England

RCN officers assisted a team of Mines and Technical Surveys personnel

in assessing the Westland SR N5 hovercraft trials on the Solent River in July. It was considered that hovercraft have a definite potential in Arctic hydrographic surveys and other operations in ice-infested waters.

Co-operation in Other Operations

From March to June, three RCN divers were seconded to the Polar Continental Shelf Project to assist in a seismic traverse on the sea ice in the Arctic Archipelago. Although these divers were not required to operate under water their experience in handling explosives was of benefit to the seismic team.

For the past three years the RCN has contributed to the financial support of the Polar Continental Shelf Project's Arctic Hydrographic Survey Programme, carried out by helicopters towing echo sounder transducers. This technique is carried out in areas which are difficult or impossible to survey by ship, and has advanced our knowledge of the hydrographic features of Arctic waters to a considerable extent. Control is by Decca, Hi-Fix. The survey of Cardigan Strait was not completed due to bad weather and ice conditions.

Financial Support to Ottawa University

Arrangements were made to transfer \$10,000 to Ottawa University to assist in a programme of shoreline geology and bottom sediment sampling from bases on Somerset Island.

Plans for 1965

Operation of naval radio stations will continue at the present level of activity in the foreseeable future.

The RCN will continue to support other Government departments in scientific and technological research programmes in the Arctic, including co-operation in the completion of the Cardigan Strait hydrographic survey.

RCN radio facilities and clearance diving teams will be made available to provide assistance in DEW Line re-supply.

Search for Historical Arctic Relics

In 1964 a team of RCN officers completed a private study of evidence related to the loss of HMS Erebus and HMS Terror, ships of the Sir John Franklin Expedition of 1845-47. The evidence was submitted to Canadian Forces Headquarters and it was concluded that as both ships had engines, boilers, and other metal it would be practical to conduct

a magnetometer search by snow toboggan on the ice prior to break up in 1965. Arrangements have been completed for the Polar Continental Shelf Project to conduct the survey in March. This will be known as the O'Reilly Island Magnetometer Survey. It was agreed there would be no press release on this operation unless one of the ships was definitely located. The magnetometer survey will also contribute to knowledge required of the magnetic anomaly of the area. One RCN officer is expected to participate in the operation. The Canadian Coast Guard has been requested to conduct a visual search of the waters to the North of O'Reilly Island by helicopter during its 1965 sea lift to Arctic posts.

ARMY

Responsibilities Land defence of the North.

The Army Survey Establishment carries out defence mapping in the north and assist the National Topographic Survey mapping the area.

Long-term Plans

Normal planning for land defence. The continued mapping of the North as required for defence purposes, and field work for the National Topographic Survey.

Review of 1964 Operations

Canadian Army operations were greatly reduced during the year. Responsibility for construction and maintenance relating to the Northwest Highway System was transferred to the Department of Public Works on April 1st. The withdrawal of administrative support to the Canadian Armed Forces, USAF, and research and development organizations at Fort Churchill, and the removal of the Winter Warfare Training Wing from Fort Churchill, further reduced Army activities in the North.

Army Survey Establishment

The main survey operation in 1964 covered the area of Melville Peninsula and the West Coast of Hudson Bay to an approximate depth of 20 NM, southward to the 60th Parallel, and can be broken into two main phases:

Phase 1 - Roving Deposit. April 11 to 30. The Roving Deposit was a joint RCAF - Army operation involving the stocking of three camps and twenty-eight gasoline caches. The operation took twelve flying days using 3 DC 3 aircraft and 1 Hercules, involving approximately 60 flights totalling approximately 12, 000 miles.

Phase 2 - Survey Operation. This was carried out using two traverse teams with an S-55 and three Bell G2A Helicopters for transporting the teams. Distance measurements were made with tellurometers and a total of 2, 500 miles were traversed. The control established was sufficient for the compilation of four maps at a scale of 1:250, 000 and 160 maps at a scale of 50, 000, covering a total of approximately 85, 000 square miles.

A reconnaissance was carried out by two officers for the next summer's survey operation. The reconnaissance party was also responsible for checking the unloading and stockpiling of the gasoline and supplies for the proposed 1965 Clinton Point and Providence Operations.

Alert

The Royal Canadian Corps of Signals continued to operate its radio station At Alert, and associated supplementary radio stations. Also at Alert, a project was initiated to provide a water supply and distribution system, and a water-borne sewage system.

Plans for 1965

2 RCR Battalion Group will participate in Exercise POLAR STRIKE, a Canadian-American joint winter exercise in Canada and Alaska.

The water and sewer system will be completed at Alert.

Army Survey Establishment

A survey of the Arctic coast, extending from Liverpool Bay easterly to Coronation Gulf, is to be carried out during the summer. As in previous years, the RCAF will assist with caching supplies on Roving Deposit.

A reconnaissance and preliminary survey will be carried out in the late summer for the 1966 summer aerodist operation in the general area surrounding the eastern half of Great Slave Lake.

AIR FORCE

Responsibilities

All aspects of air defence..

These tasks are solely a national responsibility in some areas of the North, while in others they are shared with the USA under joint agreements. Provision of Search and Rescue Services, with the assistance of other agencies as required. Provision of assistance to other government agencies in areas where normal commercial services are not available.

Long-term Plans

Continuation of present activities. Responsibilities and resources available to meet anticipated commitments in the North are reviewed on a regular basis.

Review of 1964 Operations

Roving Deposit

Three ski-wheeled Dakotas from 102 KU airlifted 150, 000 lbs of POL and supplies for the Canadian Army Survey Establishment from Hall Beach and Rankin Inlet to a camp site at Ross Bay and to 28 cache locations on Melville Peninsula and along the north-west coast of Hudson Bay. This operation began on April 11 and was completed on April 24. On completion of Roving Deposit, two of the aircraft went to Eureka and airlifted 45, 000 lbs of DRB equipment to Lake Hazen and Tanquary Fiord.

Spring Resupply

Two Hercules aircraft distributed 1, 935, 000 lbs of POL and general cargo to Resolute Bay and the Arctic weather stations in 290 flying hours between April 13 and 20. During the peak of operation the aircraft were averaging 12 round trips and 18 flying hours each per day.

Operation Boxtop IX

Two Hercules aircraft lifted 2, 688, 000 lbs of fuel oil and 1, 590, 000 lbs of general cargo from Thule to Alert during the period July 15 to

31. This airlift required 116 trips and utilized 416 flying hours. The dual delivery on Spring Resupply and Boxtop was accelerated by doubling the bulk fuel capability of the Hercules over the 1963 capability.

Fall Resupply

Two Hercules aircraft lifted 718, 000 lbs of supplies and 43 passengers to the JAWS in 94 flying hours during the period September 11 to 15.

Christmas Airdrop

Hercules aircraft delivered 21, 000 lbs of mail to 17 Arctic settlements between December 18 and 20.

Search and Rescue

Seven major searches were conducted in the north during 1964 with an expenditure of 2200 flying hours. Six of the searches were for missing aircraft, and one for a marine craft. In addition, numerous mercy flights were carried out.

Survival Training

Arctic survival training was conducted at Resolute Bay during the winter months. In addition to RCAF trainees, a number of representatives of foreign services and civilian organizations, such as the US Navy, RCMP, and DOT took part. An average of 30 personnel attended each of the six courses conducted.

Plans for 1965

Airlift

Airlift for resupply of the Arctic will be provided by C130 Hercules aircraft. The spring and fall resupply operations to the JAWS Stations and Exercise Boxtop (the resupply of Army and DOT at Alert) will comprise a total airlift of approximately 2000 tons of supplies and POL. In addition it is planned to operate scheduled routine flights by C130 Hercules. A weekly flight will be carried out from Namao-Resolute - Alert - Thule and return. There is also a scheduled flight from Namao - Whitehorse - Inuvik and return twice monthly.

Search and Rescue

Search and Rescue operations will be conducted as necessary.

Survival Training

Arctic Survival Training will be carried out during the winter months from Resolute.

DEFENCE RESEARCH BOARD

Responsibilities

To bring scientific knowledge and experience to the assistance of the Armed Services in solving problems of military operations in high latitudes. To sponsor and undertake research and technical projects of particular assistance to the Armed Services.

Long-term Plans

Research projects of two main types will be conducted: basic studies in the laboratory, and applied studies or field investigations. Almost every aspect of science is involved, with emphasis on factors, particularly cold, affecting the behaviour of man and his machines, and the physical sciences affecting communications, movement, and navigation in and under the sea, on land, in the air, and in outer space.

Review of 1964 Operations

The Defence Research Board conducted research projects on arctic and cold-weather problems through its Physics, Weapons and Engineering, and Biosciences directorates at Ottawa, the Defence Research Northern Laboratory at Fort Churchill, the Defence Research Telecommunications Establishment at Ottawa, the Prince Albert Radar Laboratory, the Defence Research Medical Laboratories at Toronto, the Pacific Naval Laboratory at Esquimalt, the Naval Research Establishment at Dartmouth, and the Canadian Armament Research and Development Establishment at Valcartier. It also supported and coordinated research in the north by means of grants and contracts to universities, government agencies, and non-government research organizations. Close collaboration was maintained with research and development agencies in the United States and Britain.

Defence Research Northern Laboratory

The laboratory continued to fulfil its functions of auroral research, assistance to visiting scientific teams, support to the Churchill Rocket Research Range, and to a lesser degree assistance to short term projects involving environment testing of equipment. In June the laboratory provided assistance to a series of high altitude balloon launchings undertaken by the British Ministry of Aviation to measure the intensity of galactic cosmic radiation at heights in which the Concord supersonic transport aircraft will operate.

The Churchill Rocket Research Range with support from DRNL has been active during the past year and for the first time a number of multiple stage high altitude rockets have been successfully launched. This has been made possible by the introduction of the extended impact area over Hudson Bay, which is operated during the winter season.

Radio Physics

The telemetry receiving station Resolute Bay continued in operation. It is used to record data from the Alouette topside sounder satellite, which completed two years of operation in September and continues to provide much information. The telemetry station also receives and records data from the S-48 satellite, a U.S.-built topside sounder which was launched in 1964. Several modifications were made to the telemetry station, and have resulted in improved quality of data recordings. The responsibility for operating vertical incidence sounders at Resolute Bay and Fort Churchill has been transferred to the Department of Transport. DRTE personnel continue to assist in their operation upon request.

Studies of the lower ionosphere were continued in the Canadian Arctic. Variations in amplitude and phase of very low frequency (VLF) transmissions from several transmitter sites were recorded at Fort Churchill. A high-power, fixed-frequency ionosonde, which was installed at Resolute Bay in 1963, was used to measure partial reflections from the lower ionosphere. Installation of similar equipment at Fort Churchill was begun in the latter part of 1964 and is expected to be in operation by the end of February, 1965.

The chain of riometer (relative ionospheric opacity meter) stations continued in operation. Their function is to measure the absorption of extra-terrestrial radiations by the ionosphere. Northern riometer stations are located at Resolute Bay, Cape Jones, and Fort Churchill. Other stations are at Prince Albert, Sask. and Val D'Or, Que.

Conjugate Point Experiment

The Pacific Naval Laboratory and Stanford University for several years have sponsored a joint program of measurements at Byrd Station, Antarctica, and at Great Whale River, its conjugate point. Magnetic micropulsations, VLF noise, ionospheric absorption of radio waves, and fluctuations of the earth's magnetic field are all being measured. The past year has seen considerable activity by the agencies at Great Whale River. The Pacific Naval Laboratory replaced most of its outdated equipment. The National Bureau of Standards, in addition to making micropulsation and VLF noise measurements, is now operating a riometer and a receiver for forward VHF transmissions from Frobisher Bay. The National Research Council has installed an all-sky camera and an auroral photometer.

New magnetometer buildings have been built and are in use, and a seismic vault is presently under construction for the Dominion Observatory. During 1965, the U.S. Army Signal Corps hopes to carry out some VLF experiments, the University of Western Ontario is planning to set up receivers to monitor satellite beacon transmissions, and the National Bureau of Standards is planning to install four more riometers with a common antenna.

Airborne Infrared Scanning of Cold Surfaces

A joint United States/Canadian project involving the RCAF, the Department of Transport, the US Army and the University of Michigan as well as the Defence Research Board, has been investigating the use of infrared sensors over ice and snow-covered terrain. Two series of flights in an RCAF Argus aircraft in arctic night conditions were undertaken in the winter of 1964 and one sortie was flown over Camp Petawawa to investigate identification of hot and cold vehicles in various conditions of forest cover in winter.

Under-ice Acoustics

Arctic ambient noise studies by the Pacific Naval Laboratory were continued with a winter field trip in January and February, the main achievement of which was to separate into two distinct types the noise generated by the cracking of the ice due to temperature changes and that generated by wind action. A summer operation in CCGS John A. Macdonald was also carried out. It had been hoped to penetrate to deep water in the Beaufort Sea, but ice conditions did not permit. Useful data were obtained however, in Viscount Melville Sound.

The Naval Research Establishment at Dartmouth is doing comparable work in the Gulf of St. Lawrence, in conditions of shallow water and a wide variety of ice conditions. Results of measurements agree well with those in the Arctic.

Geophysical Research in Northern Ellesmere Island

The Defence Research Board's camps at Lake Hazen and Tanquary Fiord were again active, the Entomology Research Institute of the Department of Agriculture using Hazen Camp and the Defence Research Board program being centred at Tanquary Camp. Further oceanographic data were obtained from Tanquary and Greely fiords, and the first oceanographic stations taken in Hare, Otto, Jugeborg, and Emma fiords and in the entrance to Nansen Sound. Marine biological records were kept in upper Tanquary Fiord and an underwater tide-gauge was operated, showing a spring tide range of 27 cm. Other work included detailed heat-balance measurements at the ice-air interface, synoptic meteorological measurements, snow and ice studies, and detailed mapping of glaciers.

Biting Flies

The Department of Agriculture, supported by the Defence Research Board, continued their investigations on the basic biology of the mosquitoes at Lake Hazen. Thirteen publications on the general insect fauna have resulted from the studies so far.

Work was continued on the residual toxicity of DDT at Churchill, Manitoba. Samples of the water, bottom soil, and vegetation in mosquito developing pools were obtained for analysis. Body fat from rodents and fish from the area is also being studied for possible DDT storage. These analyses may indicate the reason for the reduced level of mosquito development in the areas near Churchill which have a lengthy history of DDT application for biting-fly control.

Environmental Physiology

The Climatic Suite at the Defence Research Medical Laboratories is continuing to work on physiological and metabolic responses to cold exposure in humans. Animal studies are continuing to investigate: (i) the effect of cold on cholesterol metabolism, (ii) the effect of varying diets on tolerance to cold exposure, and (iii) blood pressure responses during hypothermia.

Grants and Contracts

A number of extra-mural studies were supported by grants and contracts with universities and other non-government agencies.

Grants

- (1) To McMaster University for a study of methods of interpreting surface and sub-surface conditions in muskeg from air photographs.
- (2) To McMaster University for research on consolidation of peat under load.
- (3) To McGill University for research on the shearing characteristics of frozen soil.
- (4) To the University of Ottawa for a study of the submarine geology and geophysics of Barrow Strait.
- (5) To the Arctic Institute of North America for a heat budget analysis of Jones Sound.

- (6) To the Arctic Institute of North America to assist in the preparation of an Arctic Bibliography.
- (7) To McGill University for a study of the attenuation of surface waves near pack ice.
- (8) To McGill University for work on the reactions of the constituents of the upper atmosphere.
- (9) To the University of Saskatchewan for the support of research at the the Institute of Upper Atmospheric Physics.
- (10) To the University of Western Ontario for research on the physics of the troposphere as related to UHF radio transmissions.
- (11) To the Canadian Military Services College, Royal Roads, for a study of the roles of the ionosphere and sun in the origin of the natural electro-magnetic background in the frequency range 0, 001 c/s to 100 Mc/s.
- (12) To the University of Western Ontario for studies of VHF radio wave scattering in the ionosphere.
- (13) To the University of Toronto for studies of the infra-red emission spectrum of the upper atmosphere.
- (14) To the University of Western Ontario for support ionospheric studies using satellites.
- (15) To the University of Alberta for studies on the metabolic response of men in changing temperatures.
- (16) To the University of Toronto for studies of hypothermia and endocrine function, the biochemical mechanisms involved in cold adaptation, and the effects of cold on pharmacological reactions.
- (17) To McGill University for studies of the effects of cold injury on the vascular system and the pathogenesis of cold injury.
- (18) To the University of Manitoba for studies of frostbite, cold acclimatization, and vasospasm due to cold.
- (19) To the University of Ottawa for studies of endocrine function of cold-exposed animals.
- (20) To Laval University for a study of circulatory adaption to cold stress.

- (21) To the University of Western Ontario for the investigation of changes in muscle after cold acclimatization.
- (22) To Queen's University for research on fat metabolism of cold-exposed animals.
- (23) To the Hospital for Sick Children, Toronto, for investigation and studies on accidental hypothermia.
- (24) To the University of Alberta for research on the flight range of biting flies.
- (25) To Queen's University for research on the reactive principles and specificity of bites of bloodsucking arthropods with particular reference to mosquitoes.
- (26) To the University of Western Ontario for a study of factors in the attractiveness of objects to adult Aedes aegypti.
- (27) To the University of Manitoba for research on the behaviour of biting flies with special reference to orientation and feeding.
- (28) To the Ontario Agricultural College for studies on the life history and ecology of Simulium rugglesi.
- (29) To the University of Saskatchewan for research on the retrocerebral endocrine system in prairie mosquitoes.
- (30) To the University of Western Ontario for a study on the reaction of man and animals to cold and damp.
- (31) To the University of Alberta for an investigation of the mode of action of biting fly repellents.
- (32) To the University of Manitoba for a study of personnel factors in isolated northern posts.

Contracts

- (1) With McGill University for research on Ice physics, with special reference to the study of sea ice.
- (2) With McGill University for meteorological and geophysical work at Lake Hazen.

- (3) With the Arctic Institute of North America to provide limited consultant work.
- (4) With McGill University for a study of terrain evaluation and classification for mobility.
- (5) With McGill University for stratospheric research, and for the production of an atlas of 25-mb synoptic weather maps for the Northern Hemisphere.
- (6) With McMaster University for research on muskeg trafficability.
- (7) With the University of Western Ontario for spectroscopic studies of upper-atmospheric excitation, ionization, and re-combination processes.
- (8) With the University of Saskatchewan for optical studies of auroral phenomena at Fort Churchill, Manitoba.
- (9) With the University of Saskatchewan for research on radar aurora at UHF and its correlation with geophysical phenomena. This contract is in support of the experimental program of the Prince Albert Radar Laboratory.
- (10) With St. Dunstan's University for a study of insecticide residues at a DND Establishment.

Plans for 1965

It is expected that the Board's program will be continued on approximately the same scale as in 1964.

The Defence Research Northern Laboratory will be closed about June, and negotiations are now proceeding for the transfer of all facilities and services to another agency which probably will be the National Research Council. Discussions are also taking place between US and Canadian officials in regard to the future operation of the Churchill Rocket Research Range. Under the terms of the present intergovernmental agreement - which expires in June, 1965 - the range is jointly operated and negotiations are now underway which would allow the NRC to assume administrative responsibility for future operations.

The present program of atmospheric investigations at northern locations will be continued at an increased scale. The telemetry station at Resolute Bay will be used to record data from the Alouette II satellite, scheduled to be launched late in 1965. Partial reflection measurements of the lower ionosphere will commence at Churchill early in 1965, and will be continued at Resolute Bay. Two rocket nosecones instrumented by the DRTE Rocket Section will be launched from the Churchill Rocket Range in May. This group will also provide portions of the payloads of two rockets which will be fired from CRR by the US Air Force Cambridge Research Laboratories.

It is planned to continue the physical oceanographic work in Tanquary, Greely, Hare, and Otto fiords. The detailed study of energy fluxes at the air-sea ice interface will be continued at the head of Tanquary Fiord during the spring. Synoptic meteorological observations will be made at the Tanquary Camp throughout the season, and studies on glaciers near the head of Tanquary Fiord will be continued.

A base line study of the susceptibility or resistance of blackfly larvae and adults to DDT will be initiated using techniques developed at Queen's University.

NATIONAL FILM BOARD

Responsibilities The production of motion pictures filmstrips, still photographs, and still photo stories about the Canadian North, its people and their activities and its resources; arrangements for distribution of this film material in Canada and abroad, including servicing of northern posts and settlements; assistance to government agencies by advising in the use of visual media and in planning audio-visual programmes for informational and instructional purposes.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1964 Operations

Films

KENOJUAK, completed in 1963, received the Statuette of St. Finbarr, first prize in the Art Films Category, Ninth Cork International Film Festival, Ireland, and a Special Mention Award at the Fifteenth International Exhibition of Documentary Films, Venice. The film has been on theatrical circuits, and will be released in April for community distribution through NFB offices across Canada and elsewhere.

ALONG UNCHARTED SHORES, about the British-Canadian Arctic Expedition of 1936-1939, was presented in CBC National Network telecast, and is now available for general distribution.

NORTHERN VOYAGE, describing the voyage of the icebreaker John A. MacDonald from Resolute to Eureka and Tanquary, was completed.

THE ANNANACKS, describing an Eskimo group in Northern Ungava, was produced from a one hour film of Crawley Films.

LABRADOR DIARY, (2 reels, 16mm) recording a topographical survey team's two and-a-half month winter ordeal in Northern Labrador, was produced for the Department Of Mines and Technical Surveys.

THE LAST VOYAGE OF HENRY HUDSON, (3 reels, 16mm), in the NFB's History Series and originally for television release, was produced for general distribution.

Photostories

The following photostories were produced for sale to Canadian and foreign newspapers:

GEOMAGNETIC SURVEY, describes Canada's major part in an international aerial survey of the earth's magnetic field, in which a scientific crew from the Dominion Observatories carried their investigations from Japan east to Norway and across the North Pole.

SAPOTIT, gives the story of traditional spear-fishing for arctic char by Pelly Bay Eskimos at a weir in an Arctic river.

GREAT SLAVE LAKE RAILWAY, describes the final construction of the first railway to enter the Northwest Territories.

Filmstrips

The following filmstrips were released:

ARCTIC WILDFLOWERS - a junior science filmstrip for classroom use.

GOVERNMENT OF THE NORTHWEST TERRITORIES: WHAT'S GOVERNMENT - a filmstrip sponsored by the Department of Northern Affairs and National Resources.

GOVERNMENT OF THE NORTHWEST TERRITORIES: THE HISTORY OF THE GOVERNMENT OF THE NORTHWEST TERRITORIES.

Slide sets

The following slide sets were released, each set consisting of ten 35 mm colour slides with bilingual text;

ESKIMO PRINTS PARTS I & II
ESKIMO SCULPTURE PARTS I & II
CARIBOU ESKIMO PARTS I & II
GLACIATION PARTS I & II

Distribution

Approximately \$5,000.00 was invested in new prints for the Montreal out-post film library and extra films were supplied to build up the libraries at Whitehorse and Fort Smith. Several older and unserviceable films were withdrawn from the Central outpost library, and many demands for films from Northern outposts could not be met.

HENRY HUDSON was used on the Jubilee 25 theatrical program and was screened 66 times across Canada to an audience of 25,000 people. It received also a network CBC telecast.

EDGE OF THE BARRENS has played in theatres since April and during the period April to October, there were 98 bookings in English and 3 in French. The film is cleared for community distribution and is being promoted to both adult and school audiences.

NAHANNI had 492 English and 30 French theatrical bookings by September.

JOURNEY FROM ZERO had 238 English and 15 French bookings and is being well received by community audiences across Canada.

PLANS FOR 1965

Films

The following films will be completed:

GLACIATION, a one reel, 16 mm colour film, for classroom use, on the effects of glaciation on this continent, and in particular on Canada.

THE PRE-CAMBRIAN SHIELD, a film on the regional geography of Canada concentrating on a sample study of the Saguenay area.

OIES SAUVAGES (FLIGHT OF THE WILDGEENSE), a 10-minute 35 & 16 mm colour film, which is a visual poem taking its rhythm from the course followed each year by the wild geese migrating from the Arctic to the coasts of the Atlantic.

VERSIONS OF STEFANSSON - EXPLORER; HENRY LARSEN'S NORTHWEST PASSAGE - produced originally for television.

Film strips

The following filmstrips will be completed:

FUR TRADE - a series of history filmstrips for classroom use, now in preparation.

GLACIATION - a classroom filmstrip for high school use. It will be released as a longer filmstrip than originally planned and in two parts.

ESKIMO LEGEND - a classroom filmstrip illustrating a legend by the use of original Eskimo artwork.

DEPARTMENT OF NATIONAL HEALTH AND WELFARE

HEALTH

Responsibilities

Northern Health Service

All responsibilities of the Federal Government in the field of health, except where military authorities operate health facilities within military establishments.

All responsibilities of the Territorial Governments in the field of health, undertaken by arrangements with these governments, except the hospital insurance program. These arrangements are subject to the sharing of costs between the Federal and Territorial Governments in approximate proportion to their respective responsibilities.

Consultative Services

Public Health Engineering, Epidemiology, Maternal and Child Health, etc. on request of the responsible authorities.

Long-term Plans

To develop northern health services, to co-ordinate all federal health services, and to co-operate with community health services in the same manner as would a department of health in a province. This system should, within the budgets of the interested agencies, provide for the types of health services most suitable for the unique distribution of population. To continue the operation of all existing health units in the Territories and to develop new facilities, in co-operation with the Department of Northern Affairs and National Resources, as and when the need for them is demonstrated and resources are made available.

Review of 1964 Operations

Progress continued on the implementation of both the Yukon and Northwest Territories Health Plans. The construction of Frobisher Bay Hospital was completed and it was officially opened by the Honourable Minister of Health, Miss J. V. LaMarsh, on 13 November.

The Mackenzie Zone Administration was divided into two and a new Zone based at Inuvik was created. It is hoped that this arrangement will provide more adequate supervision of medical activities.

The Pentecostal Assemblies Mission, with the aid of Federal, Territorial and Medical Services Grants, is erecting a new hospital at Hay River, to replace the old hospital which was too small for present commitments. This new institution will serve the hospital needs of both the Hay River and Pine Point areas.

No other facilities were erected during the year, but a nurse was posted to Igloodik, where it is proposed to erect a nursing station in the near future.

The recruitment of medical officers for service in the north has improved considerably over previous years and all posts were filled. A medical officer, now in residence at Cambridge Bay, is able to carry on regular tours of inspection in the settlements along the Arctic coast.

Difficulty was still experienced in recruiting dental officers and the dental health program in the north leaves much to be desired. However, the success of the pilot dental program in Whitehorse is most encouraging - the local dental practitioners, together with a New Zealand trained dental nurse employed by the Northern Health Service, are implementing a full dental health program for all Grade 1 children in Whitehorse schools and everyone associated with this project is most pleased with the results. The Dental Profession Ordinance, Yukon Territory, has been amended to allow specially trained dental hygienists to undertake simple fillings and extractions on the written prescription of a registered dentist.

The epidemic of tuberculosis at Eskimo Point, Northwest Territories, which was discussed in 1963, was controlled and continuing chest X-ray surveys carried out to ensure no recrudescence. A very extensive Tuberculosis Survey (Operation Doorstep) was successfully carried out in the Yukon Territory with the aid of the British Columbia and Yukon Tuberculosis Associations.

Three fatal cases of botulism occurred at Paulatuk during the month of August.

Two outbreaks of food-poisoning, involving about 120 persons, occurred at the mining camp at Pine Point - the infection was traced to the catering establishment. A detailed survey of kitchen hygiene procedure, carried out by Health Staff, disclosed some undesirable practices and on representation to the management improvements were carried out and no further cases occurred.

Plans for 1965

The new nursing station at Fort Franklin, scheduled for construction in 1964, will be erected. Aklavik Nursing Station will be replaced.

The Pilot Dental Project in the Yukon Territory will be extended to all Grade II pupils in the Whitehorse area.

A plan will be introduced to subsidize travel for medical necessity in the Northwest Territories. This plan, if approved by the Northwest Territories Council, will subsidize costs in excess of \$60 single fare or \$120 return fare for patients who, on the recommendation of the Zone Superintendent, have to incur heavy travel expenses for medical reasons.

A training course for 20 Community Health Workers from the Yukon and the Northwest Territories will be held.

WELFARE

Responsibilities Administration of Family Allowances, Family Assistance, Youth Allowances and the Old Age Security Program, with the co-operation of the Department of Northern Affairs and National Resources and other agencies. Assistance to elderly, blind, disabled, and needy unemployed residents of the north. Assistance to Territorial governments through the Fitness and Amateur Sport Program and the National Welfare Grants Program.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1964 Operations

Family Allowances

In the combined jurisdiction of the Yukon and Northwest Territories a total of \$1, 289, 581 was paid in Family Allowances. At the end of the year there were 6, 198 families with 15, 985 children receiving Family Allowances.

Family Assistance

Family Assistance payments made to immigrants and settlers totalled \$1, 344. In the last month of the year, assistance was paid to 10 families for 18 children.

Youth Allowances

This program was initiated in September. In the four months September to December inclusive, Youth Allowances payments in the Yukon and Northwest Territories totalled \$17, 030. At the end of the year, Youth Allowances were being paid to 352 families in respect of 440 children.

Old Age Security

Old Age Security pension payments in the Yukon and Northwest Territories totalled \$627, 871. There were 707 persons receiving pensions in December.

Old Age Assistance, Blind and Disabled Persons Allowances

Under agreements with the Yukon and Northwest Territories, the Department of National Health and Welfare pays 50 per cent of the costs to the Territories of Old Age Assistance and Disabled Persons Allowance, and 75 per cent of the costs of Blind Persons Allowances. During the year the agreements were amended to increase the maximum payment from \$65 to \$75 a month, effective December 1, 1963 in the case of the Yukon Territory and April 1, 1964 in the case of the Northwest Territories. On December 31st, in the Yukon 29 persons were covered under Old Age Assistance, 4 under Blind Persons Allowance and 3 under Disabled Persons Allowances; in the Northwest Territories 157 persons were covered under Old Age Assistance, 49 under Blind Persons Allowances and 41 under Disabled Persons Allowances.

Federal payments to the Territories during the year amounted to \$81,204 for Old Age Assistance, \$33,577 for Blind Persons Allowances and \$17,690 for Disabled Persons Allowances.

Unemployment Assistance

Under the Unemployment Assistance Agreement the Department of National Health and Welfare shares with the Yukon and Northwest Territories the costs of their social assistance payments. The Agreements provide for sharing in payments for persons who are unemployed and in need, including recipients of Old Age Security, Old Age Assistance and Blind and Disabled Persons Allowances who need additional help, and persons in homes for special care, particularly homes for the aged and nursing homes.

Since claims may be submitted up to six months after the end of the month to which they relate, complete figures are available only up to the end of June. Total payments to the Yukon during the first six months of 1964 amounted to \$34,325 and \$48,327 to the Northwest Territories. The average number of persons assisted during the six months was 319 in the Yukon and 1,138 in the Northwest Territories. Average monthly payments were \$35.85 for the Yukon and \$14.16 for the Northwest Territories.

Fitness and Amateur Sport

Under the Fitness and Amateur Sport program, federal allocations of \$35,749 were made available for the Northwest Territories and \$35,468 for the Yukon. The Territories contribute \$40 for each \$60 made available through the program. With this assistance Fitness Directors were hired by the Territorial Governments, programs of

leadership training and coach training were begun and recreational projects were established in many areas of the Territories.

National Welfare Grants Program

For the fiscal year 1963-64, \$5, 175 was made available to the Yukon, of which they used \$1, 370. The same sum was also made available to the Northwest Territories, but none used. For the fiscal year 1964-65, \$5, 495 was made available to each Territorial government but it is not expected that they will make use of these funds.

Plans for 1965

There will be a continuation of programs designed to assist in meeting the welfare needs of the population of the Yukon and Northwest Territories.

NATIONAL MUSEUM OF CANADA

Responsibilities

Investigations relating to the archaeology, physical anthropology, ethnology, botany, zoology, and vertebrate palaeontology of the north, and the collection, preservation, and display of specimens required for research and public information.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1964 Operations

The Human History Branch arranged by contract for an archaeologist and a physical anthropologist to carry out field work in the southeast corner of the District of Keewatin on early prehistoric Eskimo sites and on the physical anthropology of the Caribou Eskimos.

The Natural History Branch conducted a study of fishes of the polar continental shelf, and continued its research on mammals of the northern Yukon.

Plans for 1965

The Human History Branch will carry out archaeological investigations to the Western Arctic, and an ethnological reconnaissance in the Southern Yukon. An ethnologist will work among the Netsilik Eskimos. A large burial site discovered on the west side of Roes Welcome Sound may be investigated.

The Natural History Branch will carry out two expeditions in vertebrate palaeontology, one in the Anderson River area and one in the vicinity of Mould Bay. In addition, there are plans for the investigation of molluscs along the west coast of Hudson Bay, and for completion of the study of mammals in the northern Yukon.

NATIONAL RESEARCH COUNCIL

Responsibilities Investigations into various phases of pure and applied sciences in northern Canada.

Long-term Plans

Three Divisions of the National Research Council have a continuing interest in the North.

The Division of Pure Physics is involved in two major programs in northern Canada; cosmic ray observations and geomagnetic conjugate point experiments.

The Division of Building Research conducts studies of permafrost and northern building problems.

The Radio and Electrical Engineering Division carries out radio and optical observations of upper atmospheric phenomena (e.g. the aurora), during minimum and maximum periods of sunspot cycle.

Other Divisions of the National Research Council become involved periodically with northern work on a short-term basis.

Review of 1964 Operations

Division of Pure Physics

Cosmic ray observations were carried out at four stations in northern Canada to study the variations in cosmic ray flux. In addition to the already established station at Resolute cosmic ray super-neutron monitors were put into operation at Inuvik, Churchill, and Goose Bay. At Inuvik the first was installed in the Scientific Research Laboratory of the Department of Northern Affairs and National Resources. At Churchill, a new building was provided adjacent to the Defence Research Northern Laboratory of the Defence Research Board. A new building was also erected at Goose Bay with the assistance and cooperation of the RCAF. This is part of an international cosmic ray program and is carried on in close collaboration with Atomic Energy of Canada Ltd., Chalk River, and the Southwest Center for Advanced Studies, Dallas, Texas.

There was considerable scientific activity at the conjugate point station, Great Whale River. A new building was put up to house the electronic equipment and a high-voltage underground power line was also installed. Some of the programs were expanded and the site is now used by ten groups of the following organizations: National Research Council; Defence Research Board; University of Western Ontario; Stanford University; National Bureau of Standards and the Bartol Research Foundation. Observations made at Great Whale are of great scientific value for the study of upper atmospheric phenomena since they can be compared with similar observations made at Byrd, the magnetically conjugate station in the Antarctic.

Division of Building Research

A field survey was conducted along the Alaska Highway and branch roads in northern British Columbia and the Yukon Territory to determine the distribution of permafrost and the physical features affecting its occurrence in these areas. This work is a continuation of a program initiated several years ago to gather information to assist in mapping the southern boundary of the permafrost region. The areal extent of permafrost bodies, the depth to permafrost and, where possible, its thickness, the type of mineral soil and ground ice, were related to vegetation and other terrain factors.

A detailed investigation to determine the distribution of permafrost under and adjacent to a small lake near Inuvik, was carried out during the spring. This work is an extension of previous studies made to assess the thawing effect of bodies of water on permafrost.

Field studies were continued at the Kelsey Generating Station of Manitoba Hydro on the Nelson River to assess the performance of sand fill dykes constructed on permafrost. Changes in the ground thermal regime caused by the thawing effect of the reservoir and resulting settlements of the dykes are being observed. Studies of foundation performance at Inuvik were continued by means of ground temperature and pile movement observations.

A cooperative project was undertaken with the Department of Northern Affairs and National Resources on the design, erection, and testing of a small stressed skin panel building for the far north. This provided a useful opportunity to develop and evaluate

some simple and inexpensive designs for the joints of prefabricated buildings. These joints, consisting of folded polyethylene film and wood battens, performed very satisfactorily in the field trials of the prototype and also when tested in the laboratory, in the Division's rain leakage apparatus.

The study of condensation in northern buildings was continued, and a paper prepared on the subject for submission to the joint RILEM/CIB Symposium on Moisture Problems in Buildings to be held in Helsinki in August 1965.

Division of Mechanical Engineering

Studies of the icing conditions in Churchill Harbour were undertaken at the request of the National Harbours Board. Measurements of salinity and temperature were made throughout the harbour area at selected locations until freeze-up. Visual observations of ice cover behaviour and movement in the harbour were recorded four times daily.

Although no work was undertaken at Tuktoyaktuk or Cambridge Bay during 1964, the results of previous work were reported in a paper to the Eighth International Conference on Coastal Engineering.

Radio and Electrical Engineering Division

Radar, photographic, and photometric equipment was installed at Baker Lake and Resolute, and observations of auroral and airglow phenomena were begun in the early autumn. These studies are part of the world-wide International Year of the Quiet Sun program.

National Aeronautical Establishment

Twelve low-level aeromagnetic profiles were flown over the Labrador Sea using digitized rubidium vapour and fluxgate magnetometers. Although the flight lines were approximately fifty miles apart there appears to be good correlation between adjacent flight lines in a number of places and the area may be divided into a series of magnetic zones. These magnetic zones can be followed through the central part of the Labrador Sea and their position may correspond with offshoots of the main Atlantic Ridge.

Division of Biosciences

This Division is interested in the North as a source of psychrophilic bacteria. Samples for study were received from a number of agencies.

Plans For 1965

Division of Pure Physics

Both the present cosmic ray and conjugate point programs will continue. A super-neutron monitor will be installed at Alert in a new building to be erected in the Department of Transport complex. Some changes will be made to the present building at Resolute Bay and a super-neutron monitor will be set up there also to replace the old I.G.Y. equipment. There will be no changes made to the facilities at Great Whale River although several of the programs will be expanded. Present plans call for the installation of four more riometers, telemetry recording equipment for beacon satellites, and possibly telemetry equipment for balloon-borne instruments launched from Churchill.

Division of Building Research

Field studies of permafrost and the performance of engineering structures and facilities founded on perennially frozen ground will be continued at Inuvik, Thompson, and Kelsey. Permafrost distribution surveys will be undertaken in the Hudson Bay lowland. Attention to building superstructure problems will be maintained with specific observations on structures in which problems have occurred.

Division of Mechanical Engineering

Variations in temperature, salinity and velocity of the water in Churchill Harbour will be determined at various depths in April through the ice cover and again in late June during the ice-free period. Visual records of ice formation in the harbour will be continued during the break-up and freeze-up periods. A hydrographic survey of the inner harbour and the installation of water levelgauges will be made by the Department of Mines and Technical Surveys. Studies of sediment transport along the shore will be carried out and observational flights along the coast may be undertaken.

A pump will be installed at Tuktoyaktuk in March to circulate water

and measurements of the rate of ice melt, water pumped, and the water temperature at various depths will be made to refine the work carried out so far. Velocity, salinity, and temperature profiles will also be studied at the entrance to Kugmallit Bay to investigate the heat flow into the harbour area.

Studies of the thermal regime in Milne Inlet, Baffin Island, will be undertaken in support of the iron mining development underway in that area. Temperature and salinity profiles will be measured to depths of 300 feet or more during March and it is expected that additional observations will be made later in the year.

Radio and Electrical Engineering Division

Observations of upper atmospheric phenomena made as part of the IQSY program will terminate about mid-summer 1965 when personnel and equipment will be withdrawn.

National Aeronautical Establishment

An experimental aeromagnetic survey of a portion of Hudson Bay will be undertaken in co-operation with the Geological Survey of Canada.

DEPARTMENT OF NATIONAL REVENUE

CUSTOMS AND EXCISE

Responsibilities To administer the Customs and Excise laws and regulations, particularly the Customs control of movement of aircraft and vessels.

Long-term Plans

To increase Customs service in pace with the development of the north.

Review of 1964 Operations

In the Yukon Territory, Whitehorse and Dawson were operated as Customs ports. Sub-offices under Whitehorse were Beaver Creek, Carcross and Pleasant Camp, B.C., and under Dawson was the sub-office of Old Crow.

The regular Customs office at Frobisher Bay, N.W.T., was operated on a part-time basis by an employee of the Post Office Department, under the jurisdiction of the Port of Ottawa. The Inuvik office was operated on a part-time basis by an employee of the Department of Northern Affairs and National Resources under the jurisdiction of the Port of Edmonton.

At sixteen other points officials of other government departments acted as Customs Officers for the purpose of clearing ships and aircraft. These were as follows:

Royal Canadian Mounted Police

Baker Lake	Pangnirtung
Cambridge Bay	Pond Inlet
Coppermine	Resolute Bay
Eskimo Point	Sachs Harbour
Lake Harbour	Spence Bay
	Tuktoyaktuk

Department of Transport

Alert	Isachsen
Coral Harbour	Mould Bay
Eureka	

Plans for 1965

Normal planning to meet responsibilities.

TAXATION DIVISION

Responsibilities: The administration of the Income Tax and Estate Tax Acts; the assessment and collection of these taxes.

Long-term Plans

Normal planning to meet the requirements of this area in the light of any increases in population.

Review of 1964 Operations

Taxation matters in the Yukon Territory were handled through the District Office at Whitehorse and those of the Northwest Territories through the District Office at Edmonton.

Plans for 1965

The establishment of the Whitehorse Office is a small one of only eight persons and will be at full strength during the year.

Taxation matters in the Northwest Territories will continue to be dealt with by periodic visits by members of the Edmonton Office staff to Yellowknife, Fort Smith and other centres as necessary.

DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

CANADIAN WILDLIFE SERVICE

Responsibilities Surveys and inventories of wildlife resources; conducting research on wildlife species in relation to their habitat; collection and analysis of animal population and utilization data; recommending management procedures for particular species of economic importance; acting as consultants on fisheries and marine mammals; research, management, and administration of migratory birds under the Migratory Birds Convention Act; co-ordination of federal, provincial, and territorial action on common wildlife problems, including caribou research and management, and wildlife disease studies.

Long-term Plans

To continue the studies of major wildlife resources: to extend research to less-known species; to establish more adequate research facilities in the field; to assess the success achieved in management of wildlife resources to date, and the potential success in this endeavour for the future.

Review of 1964 Operations

Mammalogical Projects

The biologist responsible for caribou range studies attended the International Botanical Congress in Edinburgh and studied reindeer management practices and research projects in the Scandinavian countries. A preliminary reconnaissance was carried out in connection with the study of caribou summer range on the tundra.

Range studies were continued north of Great Slave Lake in order to assess the extent of forest fire damage and its effect upon plants used as food by caribou in winter.

The study of the basic nutritional requirements of barren-ground caribou and other physiological characteristics was continued in co-operation with the University of British Columbia.

Studies of barren-ground caribou distribution and utilization were continued. The tagging program was expanded to include the Bathurst Inlet herd in addition to that carried out on the Thelon River.

The study of the ecology of wolves on barren-ground caribou range was continued. Summer field studies of the biology and behaviour of wolves were concentrated in the Thelon River valley, with winter studies north of Great Slave Lake.

Field work on present arctic fox studies was completed in 1963. Laboratory analysis in Ottawa was continued, and new studies planned.

Work on polar bears continued, and included field work on Southampton Island in November.

A study was begun in the Yukon Territory to learn the significance of various factors affecting grizzly bear populations.

The study of bison ecology and movements was continued in Wood Buffalo Park and work began on the nutrition of bison on northern sedge ranges.

The study of the ecology of beaver in the southern Mackenzie District was completed and the final report will be submitted very shortly.

A study of the performance of ranch mink on diets locally available in the north is being carried out south of Fort Smith.

The study of natural population controls in muskrats and the effects of various intensities of trapping was continued on the experimental trapping area in the Mackenzie River delta. Ecological studies of beaver and mink are being carried out on the same area.

Ornithological Projects

The field study of the breeding biology of nesting arctic geese concentrated on the Anderson River delta was completed. The final report is now being prepared.

The study of the breeding biology of Ross' geese was continued in the Perry River area, and the results of the first season's investigation were published.

Aerial surveys of whooping crane breeding areas in Wood Buffalo National Park were continued. One young whooper that had been injured was captured and moved to the United States for breeding stock.

Plans for 1965

Mammalogical Projects

The results of the studies of caribou food habits and the effects of fire on caribou winter range will be published. Studies of vegetation types in caribou summer range on the tundra will be continued and extended to include range north of Great Slave Lake.

Research will continue in the nutritional requirements and the physiological characteristics of barren-ground caribou.

The caribou of Baffin Island, a population of considerable economic value, will be studied. Distribution, utilization, numbers, reproduction, and condition will be investigated, as will the study of their movements through tagging operations.

The study of wolves will be continued in relation to their effects on caribou and other prey species.

Early in the year as many as possible of the wood bison surviving in the northwest corner of Wood Buffalo Park will be captured, vaccinated for anthrax, and moved to an isolation corral near Fort Smith. After holding them in quarantine for 6 months or so, they will be moved to a holding area in Elk Island Park for propagation and research. The study of bison nutrition in Wood Buffalo Park will be terminated, and the study of their ecology and movement will be continued.

In continuing the study of polar bears in the eastern Arctic, the abundance, population structure, and rate of recruitment to the population will be emphasized. The grizzly bear research project will be continued in the Yukon Territory.

The study of the effects of various locally available diets on ranch mink south of Fort Smith will be completed.

A study of the factors affecting distribution and numbers of red squirrels will be started in the area near Fort Smith.

Studies of the population ecology of muskrats, beaver, and mink will be continued on the experimental trapping area in the Mackenzie River Delta.

Ornithological projects

In the continuing study of breeding waterfowl, emphasis will be shifted from the Mackenzie Delta and Anderson River Delta to the Old Crow flats. The study of breeding biology of Ross' geese in the Perry River area will be expanded to include their nesting range. Aerial surveys of major waterfowl breeding grounds on the Hudson Bay and James Bay lowlands will be initiated.

Aerial surveys of the whooping crane in Wood Buffalo National Park will be continued.

NATIONAL PARKS BRANCH

PARKS DIVISION

Responsibilities: The administration of the National Parks Act and regulations in order that national park areas in northern Canada are maintained and made use of for the benefit, education, and enjoyment of the Canadian people.

Long-term Plans

To select and administer areas which contain representative features worthy of preservation as part of the National Parks system.

Review of 1964 Operations

On October 1, 1964, the Branch took over responsibility for determining policies and procedures in Wood Buffalo National Park. Operational responsibility will remain with the Northern Administration Branch until March 31, 1965.

Plans for 1965

Unless there is a specific request to assess the national park potential of a particular area, no field studies will be carried out. A major effort will be made to combat anthrax in the Wood Buffalo Park buffalo herd. The possibility of adjusting the park boundaries will be investigated.

HISTORIC SITES DIVISION

Responsibilities: The administration of sites and structures of national historic importance.

Long-term Plans

To conduct a study of national history related to the Canadian north in order to select, preserve, and commemorate sites and structures of national historic importance.

Review of 1964 Operations

The Palace Grand Theatre and the sternwheeler "Keno" both in Dawson City, were maintained and open to the public during the tourist season.

Plans for 1965

One of the three sternwheelers remaining in Whitehorse will be moved to a municipal park there and an historical museum installed on board. This museum will be concerned with the interpretation of the history of river navigation in the Territory. These proposals are closely tied in with the Whitehorse Metropolitan Area Development Plan.

THE COUNCIL OF THE NORTHWEST TERRITORIES

Responsibilities

To exercise legislative powers comparable to those of a province.

Long-Term Plans

The enactment of legislation comparable to that of a province and in keeping with changing conditions; gradual evolution toward provincial status with a representative and responsible government.

Review of 1964 Operations

The former Council having expired in November, 1963, an election was called on March 31, 1964, for election of members of the Territorial Council. As a result, Peter Baker was elected in Mackenzie North, J.A. Goodall in Mackenzie River, Lyle R. Trimble in Mackenzie Delta and Robert Porritt in Mackenzie South. In early summer the Governor in Council announced the names of the appointed members. They were: A/M Hugh Campbell, C.B.E., LL.D., Robert N. Harvey, Stuart M. Hodgson and Dr. Frank Vallee. W. G. Brown had been appointed member and Deputy Commissioner at an earlier date.

Two Sessions of Council were held, one in Ottawa in June and one in Frobisher Bay in November. At the first Session fifteen Bills were passed including the Annual Appropriation Ordinance and a Supplementary Appropriation Ordinance for 1964-65. Two of the remaining Bills increased allowances to disabled persons and old age assistance and blind persons allowance to bring them in line with the Federal payments. Two other Ordinances authorized the signing of franchises with the Canadian National Railways Telephone System and with Northland Utilities Limited for the installation and operation of an electrical supply system at Fort Providence.

A milestone of Territorial Education was passed when Council approved an Ordinance authorizing a system of loans and grants to students from the Territories for higher education.

There were sixteen References for Advice and twenty-two Sessional Papers ranging over a wide variety of matters of interest and concern to the Territorial Council.

The second Session was preceded by a tour by Council members through

the District of Mackenzie and along the Arctic Coast enroute to Frobisher Bay for the session. This afforded members their first opportunity to familiarize themselves with the Territories and to meet and talk with local people since they became members of Council. At the Session six Bills were passed, six Sessional Papers were dealt with and eleven References for Advice were considered. This Session was notable for the suggestion that the Territorial Government subsidize the cost of electric power so that no domestic non-commercial user would have to pay more than five cents per kilowatt hour, and for the decision to go ahead with legislation authorizing the establishment of a Territorial Public Service. Council also decided that in future their Debates would be recorded verbatim.

Council passed two resolutions of tremendous importance to the future of the Territories. One resolution requested the Federal Government to increase the number of members of Council so that there could be representation on the Council from all parts of the Territories; the other requested the Federal Government to appoint a Commission to recommend plans for the future of the Northwest Territories, covering all aspects thereof including political, economical, educational and industrial and particularly the structure of the Territorial Government.

The legislation to divide the Territories, which had been introduced to Parliament in 1963 but which died in committee when Parliament prorogued, was not re-introduced in 1964.

There was a substantial increase in the number of beaver, fox, marten, mink, weasel and wolf taken. Lynx, muskrat, squirrel and wolverine declined sharply. The catch of fisher and otter remained about the same. The value of furs taken during 1963-64 was estimated at \$1, 163, 004 compared with \$846, 420 in 1962-63. The increase reflects the cyclical increase in white fox and the improved prices for most species.

General

The new Council differed on the proposal to divide the Territories. They took note of the several objections which had been raised to it and rather than push the question, they asked the Government to withhold action pending the recommendations of the Commission of Inquiry.

Other matters that Council discussed were the high cost of living in the Territories, education, lack of employment, the population

explosion and plans for further development of the Territories, in a climate favourable for the growth of industry and by the establishment of local co-operatives. Tourism came in for a good deal of attention. Council also sought the establishment of its own civil service and a gradual assumption by it of functions formerly carried out by federal civil servants of the Department of Northern Affairs and National Resources. As a step in establishing the Government of the Northwest Territories as a separate entity, the Government appointed Mr. B. G. Sivertz, the current Commissioner, as a full-time Commissioner of the Northwest Territories and set up his office separate from the Department of Northern Affairs.

The Territorial Government continued to participate financially with the Federal Government in providing such services as education, health, road construction, justice, and other matters handled by the Federal Government which are either wholly or partly the responsibility of the Territorial Government. Participation was on the basis recommended in the Report of the Interdepartmental Committee on Federal-Territorial Financial Relations, 1962.

Plans for 1965

The Territorial Government will continue to administer the affairs of the Territories with growing emphasis on the establishment of its own Civil Service and the assumption of functions formerly carried out on its behalf by federal civil servants.

COUNCIL OF THE YUKON TERRITORY

Responsibilities To exercise legislative powers comparable to those of a provincial legislature.

Long-term Plans

Enactment of legislation comparable to that of the provinces and in keeping with changing conditions: gradual evolution toward provincial status.

Review of 1964 Operations

The Council was called for two sessions. The first was from March 23 to April 30, and the second from November 9 to December 4. During the first session 17 ordinances were passed, the most important of which was an amendment to the Liquor Ordinance. The second session dealt with 14 ordinances, the most important of which were Apprentice Training, R.C.M Police Agreement and an amendment to the Dental Profession Ordinance.

The Territorial Council Financial Advisory Committee visited Ottawa in the spring to discuss matters concerning the Territory. A Territorial election was held in the fall, at which time 4 Councillors were re-elected. In addition, three new councillors were elected. They were: J.K. Thompson for Whitehorse North; R. MacKinnon for Carmacks-Kluane; F.G. Southam for Mayo.

ADMINISTRATION OF THE YUKON TERRITORY

Responsibilities To administer the Ordinances of the Yukon and carry out the responsibilities of the Department of Northern Affairs and National Resources in the Territory except those relating to water resources.

Long-term Plans

Economic and industrial development to the point where increased population and revenues resulting therefrom would warrant full provincial status.

Review of 1964 Operations

Territorial Secretary

The Territorial Secretary issued 322 licences under the Business Licence Ordinance, 16 under the Insurance Ordinance and 6 under the Motion Picture Ordinance. 18,638 licences, certificates, registrations, etc., were issued under the Motor Vehicle Ordinance. 190 Boiler Inspection Certificates were issued. The office recorded 502 Births, 77 Deaths and 89 Marriages in the calendar year, again a slight decline over last year. The total tax assessment, April 1, 1964 to March 31, 1965 is \$6,310,000.00, and the total taxes imposed approximately \$207,500.00. Approximately 50 complaints were dealt with under the Labour Provisions Ordinance and the Annual Vacations Ordinance. In three cases it was necessary to take Court action. It was also necessary to take Court action against a company for failure to take out and maintain in force a Workmen's Compensation Insurance Policy.

Legal Adviser

Council at its two sessions had before it a total of 32 Bills, compared with 31 Bills reviewed in 1963.

The work of the Legal adviser in and out of Council has followed the general pattern of previous years in most respects, that is, he has been Registrar of Land Titles, Registrar of Joint Stock Companies, Registrar of Corporation Securities and Public Administrator.

The volume of Land Titles work increased slightly, and 63 companies were registered as against 59 in 1963. The number of societies registered was 10, compared with 6 in the previous year. On December 17, companies in the register totalled 475, and societies totalled 72.

The Legal Adviser attended the Conference of Commissioners on Uniformity of Legislation and the Bar Convention. As foreshadowed in the Commissioner's 1963 report, a Senior Legal Adviser was appointed. The present Legal Adviser was appointed to the Justice Department and assumed the new duties. A competition is now in progress to select another lawyer to work in the office. Full details of work have not been settled but in general the Senior Advisory Counsel will supervise Justice staff, undertake general supervision of criminal work and will act as Counsel in prosecutions occasionally, though it is

not intended to disturb the present arrangement with the Crown Attorney. The effect of the appointment is to give direct communication with the legislative section in the Department of Justice and when an assistant has been added to the office strength, the new structure should yield increased efficiency and expedition.

The volume and complexity of the estates handled by the Public Administrator has increased during the past year.

Territorial Department of Education

For the first time in many years enrolment in Yukon schools has reached a plateau. In September 1964 there were 3,033 pupils enrolled in 23 schools with a full-time teaching staff of 149. This compares with 3,096 pupils, 22 schools and 147 full-time teachers in September 1963. The reason for the slight decrease in enrolment was the departure of the Canadian Army from the Yukon. By September 1965 it is anticipated that enrolment will again begin to rise with 3,307 pupils expected in our schools.

In addition to the 23 schools which are part of the Territorial system, the Department of Education also supervises instruction in the Carcross Indian Residential School and the Lower Post Indian Residential School. There are a total of 280 pupils and 11 teachers in these two schools.

There was an even greater emphasis than before on instruction which would meet realistically the needs of individual pupils. A level system of continuous promotion introduced into the primary grades was greeted with enthusiasm by both parents and teachers. An opportunity class for slow learners was commenced in September. The Department has been giving substantial financial support to a retarded children's class which also began operation in September. At the beginning secondary level the Occupational Program continues to prove very successful in preparing non-academically inclined young people for the Vocational School or for the service industries.

In June, students in grades 11 and 12 of the University Entrance Program wrote a total of 339 examination papers administered by the British Columbia Department of Education. Of these, 252 papers received passing grades. The number of secondary school graduates was the largest in our history. A total of 20 students graduated in the University Entrance Program and 12 in the General Program. There were also two Senior Matriculation graduates.

Vocational Training

Graduation for 7 Nursing Assistants was held in June, at the F.H. Collins Auditorium. Of this group, 4 remained in Yukon in employment, one returned to complete high school, in order to go on to University to complete training for her R.N., and 2 found employment in hospitals outside.

A similar experience was found with the girls graduating from Beauty Culture. Only 4 of the 9 remained in Yukon, one girl went to Alberta to take specialized training in styling - wrote her Alberta examinations in Beauty Culture and passed these with excellent credit.

We were able to check 79 students from the school that had obtained employment as a direct result of their training.

All instructors were sent out to U.B.C. Summer School for 7 weeks, taking two teacher training courses equivalent to 6 credits towards Vocational Instructor certificates. The results have been very evident in the term commencing in September. Enrolment was greater than in 1963. Plumbing was dropped from the curriculum for lack of applicants, but a course in Basic Training for Skill Development was begun, with eight students enrolled.

Night School courses in welding, carpentry, drafting and heavy duty mechanics were all well attended.

In scholastic achievement, the students averaged just over one academic grade above those of 1963.

Territorial Department of Public Works

All roads in the Territory, with the exception of the Alaska Highway and the Haines, Aishihik, Snag and Cassiar Roads, were maintained by Territorial crews and equipment. The anticipated cost of road maintenance to the end of the fiscal year is approximately \$950,000 compared with \$760,000 for the previous year. Road maintenance crews were employed fighting floods in Mayo and Dawson City during June, at a cost of \$62,000.

Year-round maintenance was carried out on 86 Federal and 116 Territorial buildings, as compared to 82 and 98 in the previous year.

Building construction dropped from \$1,450,000 in 1963, to \$360,000. No major buildings were begun, but new schools in Watson Lake, Haines Junction and Teslin, started in 1963, were completed. Most of the work consisted of minor renovations and additions to existing buildings.

Road construction expenditures increased from last year's \$525,000 to \$590,000. The major items were reconstruction projects on the Whitehorse-Keno Road between Mile 101 and 124, and bridge replacements on the Canol Road.

Miscellaneous projects including partial removal of the Old Lewes River Dam, amounted to \$70,000.

Forestry

Forest fire losses were the lightest on record, with only 25 fires burning a total of 480 acres. The 23 fires which were fought burned a total of only 30 acres. The two remaining fires were in inaccessible areas, were not fought, and destroyed 450 acres. This light fire loss can be attributed almost entirely to abnormally cool temperatures and heavy precipitation.

During the season, two new fire look-outs were completed and all access roads improved. The seven look-outs now in operation, were also supplemented with a Super-Cub aircraft on contract, which greatly improved the detection system.

Investigations have continued in co-operation with Canadian National Telecommunications on the feasibility of a VHF radio system for the Yukon Territory.

Timber production remained at approximately 8 million board feet and 2 million lineal feet of round timber. A large proportion of this production was utilized by the mining industry in the Mayo district. The Forest Service continued operation of public campgrounds and carried on major improvements at three sites.

Mining

Over forty companies were actively engaged in exploration or mine development, individually or in conjunction with others as syndicates or through indirect participation in particular projects. A healthy interest was shown by the four major Japanese mining companies along with their various trading organizations. One Japanese company has taken

a direct financial interest in a Yukon company and others have conducted extensive and detailed property examinations.

This increase in development has been partially brought about by world conditions and the increased price in most metals. At the same time, the Yukon is accessible to Pacific markets. Further incentive is provided by prospects for assistance from the federal government.

The two projects for assistance to the mining industry which have been outstanding are the Tote Trail Assistance and the Prospector's Assistance Program. Under the revised Prospectors' Assistance Program a prospector can receive up to \$900.00 cash to help defray expenses for a minimum of 60 days in the field. Up to 2/3 of this amount is available to him at the start of the field season. This year, 37 prospectors took advantage of this program. The Tote Trail Assistance Program is intended to provide access to and encourage exploration and development of a mining property in its early stages. At least six companies and eight prospectors received direct assistance this year.

The two producing mines continued to maintain their production. The Yukon Consolidated Gold Corporation had production in excess of one million dollars. However, production is being progressively reduced so that present economic reserves should be exhausted by 1966.

Production by United Keno Hill Mines Limited continued as the major producer of the Yukon and the largest silver producer in Canada.

The Tantalus Butte Coal Mine at Carmacks operated by Conwest Ltd. continued to supply United Keno Hill Mines with coal for domestic heating. Production varies but is in the order of 8,000 tons of lignitic coal per year.

The exploration trend established last year continued through 1964 with emphasis placed on development work of known mineral occurrences rather than on exploration for new mineral occurrences.

Oil and gas exploration continued throughout the year with Socony Mobil being the most active company. During the year this company drilled three deep test wells in the Eagle Plains area. One well is classed as a suspended gas well and the other two are dry and abandoned. In the south-east corner of the Territory, Canada Southern completed a well at 14,495 ft. This is classed as a suspended gas well. Socony Mobil conducted seismic exploration surveys on the Eagle Plains for nine months of the year. For the first five months they operated with

conventional tracked equipment and during June, July, August and September, when ground conditions are poor, they conducted the survey with helicopter-borne drills and recording equipment. Pan American conducted seismic surveys of eight crew months duration with conventional tracked equipment in the Kokaneelee and Liard areas of the south-east Yukon. At the time of writing, no geophysical surveys are in progress but some deep test wells are in the drilling and planning stages. Socony Mobil spudded in a well in early December on Eagle Plains.

Officers of the Resources Division conducted safety inspections on oil rigs and in hard rock, placer and coal mines. They also made safety inspections at various industrial operations throughout the Territory. Investigations and inspections were also made on mining claims in order to assist the Mining Recorders in the administration of mineral rights.

Office of the Supervisor of Lands

Interest in vacant Crown lands continued at a high level. Most inquiries concerned the use of lands for agricultural and grazing purposes. Total land applications received in the Whitehorse office were:

Summer Cottage	-	54
Commercial	-	22
Residential	-	22
Grazing	-	20
Agricultural	-	5
Religious	-	1
Quarrying	-	1
		<u>125</u>

In the 1963-64 fiscal year, total revenue derived from the sale of federal crown lands and lands under the administration and control of the Commissioner (including lease rentals, licenses, etc.) was \$80,617.74.

Ranchers and outfitters have begun to realize the benefits of obtaining grazing leases. This resulted in a total of 23,556 acres under lease with 33 grazing leases in effect, and 13 additional lease applications were being processed.

To encourage the opening of recreational areas, the Territorial Government initiated a new policy of building roads into areas which have good potential. This resulted in new cottage-site subdivisions at Tagish, and at Ethel Lake in the Mayo district.

Two teams of Dominion Land Surveyors were active in the Yukon this

summer and they have reduced the backlog of outstanding legal surveys in Whitehorse, Carmacks, Haines Junction, Beaver Creek and Teslin. This year a private Dominion Land Surveyor opened an office in Whitehorse. This should assist the private sector in obtaining survey requirements, without waiting for surveys to be carried out during the summer months.

The Department of Transport accepted the recommendation of the Community Planning group, that the new housing for the airport at Burwash Creek be built at Destruction Bay.

Territorial Department of Travel & Publicity

Tourist travel increased approximately 7% over the 1963 volume producing about two and one half million tourist dollars during the summer season. Successful efforts to retain the tourist a little longer and to divert him through various parts of the Territory (particularly Dawson City) have increased the dollar value of the tourist. The Alaskan earthquake and inclement weather throughout the season reduced the expected increase in the number of visitors this year.

An extremely successful tour of North America by "Yukon Bud" Fisher early this year resulted in much wide-spread publicity for the Yukon.

Direct mail enquiries processed by the Department of Travel and Publicity totalled 26, 000, an increase of approximately 48% over 1963.

Territorial Department of Housing and Area Development

This Department continued its program of assistance to communities throughout the Yukon in municipal matters. The squatter removal program in Whitehorse progressed at an accelerated rate during the year although there are still many areas which will require much work before being cleared.

Fire protection for all communities received a great deal of attention and a program has been established to raise the standards of equipment throughout the Yukon.

The Department worked very closely with the City of Whitehorse regarding the Whitehorse Metropolitan Plan and much progress has been made in its implementation.

Territorial Department of Welfare

This department is responsible for the provision of all social welfare services to non-Indians in the Territory, and extends child welfare services to Indians under an agreement with Indian Affairs Branch. Probation services to juvenile and adult offenders are also provided

under a newly established Corrections Program. Additional responsibilities include the administration of a 15-bed nursing home, two senior citizens homes, and two district welfare offices.

During the year the Department has continued to develop its existing programs and to improve standards of service. The most recent report indicates that the total caseload carried during a twelve-month period was 1, 183, involving 2, 441 individuals. This was an increase of 139 cases over the previous 12 month period.

Social work staff was increased during the year and the heavy case-loads previously carried by the workers were reduced to a more reasonable number. This permitted more intensive case-work with clients, improved preventive service, and more extensive coverage of outlying areas. A stepped up adoption program has resulted in an increase in adoption placements of Territorial wards.

Negotiations were completed with the Alberta Alcoholism Foundation to extend its services to the Yukon and in November, 1964, a branch agency known as "Yukon Alcoholism Services" was established in Whitehorse. The agency is staffed by a professional counsellor and is operated by the Alberta Foundation.

Regional Library

A new branch library was opened in the Takhini area with the co-operation of the Takhini Community Council. Several new deposit stations were established, bringing the total of Regional Library outlets to seven permanent branches, seventeen deposit stations, nineteen schools and four kindergartens.

All libraries reported increasing demand for books and reference assistance during the year. Unfortunately, lack of adequate space in the Regional Headquarters and the Whitehorse, Dawson City, and Elsa branches is severely restricting library service. It is hoped, however, that this situation will be somewhat alleviated in 1965.

Approximately 7500 new books were processed in 1964 and the number of books circulated to libraries totalled more than 19, 000.

Liquor Department

The numbers and types of licences issued during the year were as follows:

Cabaret	- 6
Cocktail	- 21
Dining Room	- 7
Tavern	- 24
Military Messes	- 4
Canteen, beer only	- 9
Clubs, including	-
social and service	- 3

Amendments were made to the Liquor Ordinance providing for the manufacture of Home Brewed Beer and Wine Permits. Hours of operation were written into the Ordinance both for liquor outlets and liquor stores. The change in the liquor store hours has increased the cost of operation considerably. The sale of draught beer by the glass was introduced in the Territory in June of this year. Five liquor stores are operated in the Territory.

Total gross sales for the months of April 1st, 1964 to November 30th, 1964 amounted to \$1,629,415.37, as compared to \$1,641,599.95 for the corresponding period in 1963.

Imported items such as Scotch, Gin and Brandy have been reduced in price due largely to the contents being reduced from 26 $\frac{2}{3}$ oz. per bottle to the standard package of 25 oz. per bottle. Ryes, Gins and Vodkas were increased due to increased cost from the Canadian Distillers.

Longer store hours have led to staff increases. Four new employees were hired at Whitehorse, one at Watson Lake, and one at Mayo. Staffs at Dawson and Haines Junction remain unchanged.

Public Health

A large room in the old school building at Teslin was renovated for use as a Health Station. Operation Doorstep, a combined Tuberculin testing and chest x-ray survey, achieved its objective of screening 80% of the residents of the Yukon Territory. Over 11,000 residents were skin-tested and/or x-rayed. Two cases of tuberculosis, one of lung cancer and two hundred other less serious abnormalities were detected. The survey was carried out as a joint program of Yukon Health Service and Yukon Tuberculosis Association.

An amendment to the Dental Profession Ordinance was passed by

Territorial Council to enable suitably qualified dental hygienists to undertake operative dentistry as part of the pilot project of a Yukon School Dental Service. Parents have requested enrolment of nearly 500 children for this second year of the project. It is estimated that 75% of the operative work required will be carried out by the Dental Nurse, the remainder being referred to the Whitehorse Dental Clinic.

Consultant visits during the year included those by a team from the Alberta Child Guidance Clinic, an internist, an ophthalmologist and an E.N.T. Specialist.

Territorial Department of Game

A total of 210 non-resident big game hunters - 199 aliens and 11 Canadians - were licensed during the hunting season. This was an increase of 32 hunters over 1963. They paid 62 extra trophy fees. In addition, 17 licenses were issued to non-resident game bird hunters.

Big game animals and predators taken were as follows:

Moose	75	Goat	9
Sheep	147	Black Bear	7
Grizzly Bear	61	Wolves	5
Caribou	106	Wolverine	5

Outfitters, Chief guides and Assistant guides licenced and employed in this industry were as follows:

Outfitters	-	21
Chief guides	-	34
Assistant guides	-	56

During the 1963/64 licence year (July 1 to June 30) a total of 2,582 Resident hunting licences were issued in the Yukon Territory. It is expected that the number will increase in the 1964-65 license year.

Under the Predator Control Program, 82 wolves were taken on poison baits. The total for 1963 was the same, but it seems likely that heavy snowfalls in 1964 prevented discovery of the bodies of some poisoned wolves.

A number of patrols again were conducted in co-operation with the R.C.M. Police and the Yukon Forest Service, and inspections

were made of outfitters' equipment and horses. Base camps of several outfitters were visited by aircraft to check sanitary conditions and interview hunters and guides.

Due to increased fur prices, native and white trappers have shown much more interest in trapping. The demand for new trapping areas has been steady, and approximately 225 old traplines have been re-registered for the second five year period.

The Department handles a large volume of requests for information from many parts of the world, notably from prospective hunters, students, and employment seekers.

Department of Territorial Treasurer

Responsibilities of the Territorial Treasurer, who is also Collector of Taxes, Inspector of Municipalities, and Supervisor of Territorial Hospitals, include, inter alia, the administration, in whole or in part, of the following Ordinances and Agreements.

Ordinances

1. Financial Administration Ordinance
2. Taxation Ordinance
3. Fuel Oil Tax Ordinance
4. Amusement Tax Ordinance
5. Yukon Hospital Insurance Services Ordinance
6. Liquor Ordinance
7. Municipal Ordinance
8. Public Service Ordinance
9. Territorial Employees' Superannuation Ordinance

Agreements

Federal-Territorial Financial Relations Agreement
Federal-Territorial Engineering Services Agreement
Yukon Hospital Insurance Services Agreement
Technical and Vocational Training Agreement
Unemployment Assistance Agreement

The Public Accounts of the Territory reflect substantially increased activity as a result of the expansion of Territorial Government services in recent years.

ESTIMATED CURRENT DEFICIT POSITION

AS AT MARCH 31, 1965

Balance Current Deficit as at 1st April, 1964		\$ 1,853,696.00
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Add:

Estimated excess of budgetary expenditure
over budgetary revenue 1964-1965.

Operation and Maintenance:

Estimated expenditure	6,894,004.00	
Less: estimated net unexpended balance		400,000.00
		<u>6,494,004.00</u>

Deduct:

Operating Revenue	4,586,052.00
Less: non-budgetary receipts	19,926.00
	<u>4,566,126.00</u>

<u>Deficit Grant</u>	<u>1,868,013.00</u>	<u>6,434,139.00</u>	59,865.00
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Operation and Maintenance
Projects financed 100% by
Canada under the Federal-
Territorial Engineering
Services Agreement.

Estimated Expenditure	65,800.00	
Estimated Revenue	<u>65,800.00</u>	Nil

Loan Amortization

Estimated expenditure	560,595.00
Less: non-budgetary receipts	236,547.00
	<u>324,048.00</u>

Deduct:

Amortization	
Recoveries	126,958.00
Less: non-budgetary receipts	27,433.00
	<u>99,525.00</u>

Loan Amortization Grant	<u>433,636.00</u>	<u>533,161.00</u>	(209,113.00)
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Project and Loan Capital

Estimated Expenditure		1, 918, 368.00	
Less: estimated net unexpended balance	400, 000.00		
non-budgetary disbursements	270, 000.00	<u>670, 000.00</u>	
		1, 248, 368.00	
Deduct:			
Capital Recoveries	692, 856.00		
Less: non-budgetary receipts	<u>230, 000.00</u>	<u>462, 856.00</u>	785, 512.00

Capital Projects financed 100% by Canada under the Federal-Territorial Engin- eering Services Agreement.

Estimated expenditure	570, 000.00		
Estimated Recovery	<u>570, 000.00</u>	--	<u>636, 264.00</u>
Balance estimated Current Deficit as at 31st March, 1965			2, 489, 960.00

Plans for 1965

Public Works

A major program is planned, including building construction projects valued at \$1, 400, 000, and road construction projects totalling about \$700, 000.

Forestry

One new fire look-out will be built, to bring the total number of look-outs to eight. As an aid to fire suppression, it is hoped that a VHF radio system will be partially in operation. Two new campgrounds are proposed, and limited camping facilities may be provided in conjunction with new recreation access roads being built by the Territorial Government.

Welfare

A new district welfare office will be opened in Watson Lake with a social worker in charge, thus providing a more extensive service in the south-eastern part of the Territory.

It is also planned to review our existing welfare legislation and to draft recommendations for much needed revisions in our Protection of Children and Adoption Ordinances, as well as to submit proposals for a Social Assistance Ordinance.

It is hoped that a small group home can be constructed in 1965 to accommodate and meet the special needs of a number of emotionally disturbed adolescents who are wards of the Yukon Superintendent of Child Welfare. The proportion of emotionally disturbed children of all ages who come into our care as neglected children or potential delinquents is high and present facilities make no adequate provision for the attention that must be given to the special needs of these children.

Territorial Treasurer

Estimated Current Deficit Position
as at 31st March, 1966

Balance Estimated Current Deficit as at 1st April, 1965 \$ 2, 489, 960.00

Add:

Estimated excess of budgetary expenditure
over budgetary revenue 1965-1966.

Operation and Maintenance

Estimated expenditure 6, 734, 478.00

Deduct:

Operating Revenue 4, 636, 997.00

Less: non-budgetary
receipts 20, 716.00
4, 616, 281.00

Deficit Grant 2, 111, 263.00 6, 727, 544.00 6, 934.00

Operation and Maintenance

Projects financed 100% by
Canada under the Federal-
Territorial Engineering
Services Agreement.

Estimated Expenditure 218, 800.00

Estimated Revenue 218, 800.00 Nil

Loan Amortization

Estimated Expenditure 628, 614.00

Less: non-budgetary
disbursements 298, 354.00
330, 260.00

Deduct:

Amortization

Recoveries 69, 548.00

Less: non-budgetary receipts

28, 598.00

40, 950.00

Loan Amortization

Grant 518, 900.00

559, 850.00

(229, 590.00)

Project and Loan Capital

Estimated Expenditure

3, 285, 559.00

Less: non-budgetary disbursements

85, 000.00

3, 200, 559.00

Deduct:

Capital Recoveries 1, 015, 689.00

Less: non-budgetary receipts

85, 000.00

930, 689.00

2, 269, 870.00

Capital Projects financed

100% by Canada under the Federal-Territorial Engineering Services Agreement.

Estimated Expenditure

674, 500.00

Estimated Recovery

674, 500.00

Nil

2, 047, 214.00

Balance estimated Current Deficit as at 31st March, 1966.

4, 537, 174.00

Explanatory Note:

The deficit position of Current Surplus indicated in this statement has been created by expenditure, actual and estimated, on Capital Projects. Monies which have enabled, and will enable, the Territory to incur that expenditure were, and will be, borrowed from the Federal Government under the Federal-Territorial Financial Relations Agreement and such borrowings have been, and will be, set up in the accounts as loans from the Federal Government.

Payments of annual instalments of principal and interest due on those loans have been, and will continue to be, made with monies received from

the Federal Government in the form of Amortization Grants. These Grants are taken into Revenue and find their way into Current Surplus. Accordingly, when the loans are fully repaid Current Surplus will have received, by way of Amortization Grants, monies equal in total to the expenditure which has created the deficit position.

The deficit position should, therefore, be considered offset by Federal loans, the balances of which, on the 31st of March, 1966 are estimated to be as follows:

Capital Borrowing Program	\$6, 308, 115.07
Whitehorse Regional Hospital	642, 563.20
General Purposes	434, 825.36
	<u>7, 385, 503.63</u>

NORTHERN ADMINISTRATION BRANCH

Responsibilities

The Branch headquarters in Ottawa had seven divisions carrying out the staff, advisory, planning, and co-ordinating functions connected with the implementation of departmental policies. Responsibilities are detailed below under the appropriate divisions.

Administration Division

Finances, staff recruitment and management, procurement of supplies, administrative procedures, administration of low-cost housing programs, and publication of the magazine North.

Engineering Division

The construction and maintenance of roads, buildings, and utilities, and the operation of power plants, sewage systems, heating plants, and other electrical and mechanical equipment. Provision of engineering assistance to the territorial governments.

Education Division

Development and operation of a school system for the Northwest Territories (outside the organized school districts in Yellowknife and Hay River) and Arctic Quebec. Provision of vocational education and adult education in these areas. Operation of a hostel and combined vocational high school in Yellowknife. Responsibility for other hostels in the Territories, which are operated under contract by the Roman Catholic and Anglican Missions.

Industrial Division

Improvement of economic conditions by encouraging better harvesting of food resources, developing cottage industries and co-operatives, and enabling Eskimos to build their own houses at low cost. Area surveys of renewable resources on which to base projects. Development of the tourist industry in the Northwest Territories and broad programs of assistance to industry.

Resources Division

Administration of Crown-owned mineral rights, oil and gas, forests and lands in the Yukon and the Northwest Territories, and certain

Crown-owned lands for which the federal government is responsible in the provinces.

Territorial Division

Provision of the secretariat of the Government of the Northwest Territories; acting for the Government on the negotiation of federal-territorial financial arrangements; administration of Territorial Ordinances; provision of advisory services on Yukon affairs; specific activities in the Northwest Territories including game management, hospital insurance, labour, municipal affairs, and liquor management.

Welfare Division

Provision of welfare services to all residents of the Northwest Territories other than Registered Indians on behalf of the Federal and Territorial Governments, and to the Eskimos of Arctic Quebec and Manitoba. Operation of rehabilitation centres at Inuvik and Frobisher Bay, of childrens' receiving homes at Fort Smith and Yellowknife, of a Home for the Aged at Aklavik, and of transit centres at various northern points. Provision of housing for needy families. Provision of advice on Yukon welfare matters as required.

Field Organization

The field organization is divided into two administrative districts. The Mackenzie District, with headquarters at Fort Smith, has three regional offices supervising nine administrative Areas. The Arctic District, with headquarters in Ottawa, is made up of three Regions containing a total of sixteen Areas. The Regions report to the Districts, which report in turn to Branch Headquarters in Ottawa.

Long-term Plans

The process of decentralization, begun several years ago, will continue. Under this program, administrative authority and responsibility are being transferred from Branch headquarters to the District offices, and in turn to the Regional offices.

In connection with the development of a more independent status for the Northwest Territories, the Branch must provide administration for a series of transitional stages toward territorial self-government, and must establish an administrative system which can be taken over gradually by the developing territorial governments. More specific plans are given below, under the headings of the various Divisions.

Education

To expand academic, technical, and vocational training programs, and to increase new school construction to provide facilities for the entire school-age population of the north. Vocational guidance and placement services will be expanded. Education beyond the secondary school level is being encouraged by a program of financial assistance for higher education sponsored by the Territorial Government, and through the Canada Student Loan Plan. The adult education program will include courses in functional literacy for Indians, Eskimos, and Metis.

Engineering

To provide more economical, functional, and attractive buildings to meet departmental needs; to construct roads giving access to the natural resources of the north; to provide town plans for northern settlements; to provide a field engineering staff in the Northwest Territories which eventually can form the basis of a territorial engineering staff.

Industrial

To improve the economic circumstances of local peoples through area planning studies, investigation of improved methods for harvesting food resources, market research, and the development of co-operative enterprises, cottage industries, and low-cost housing. The possibilities of assisting local people to establish small businesses and industries will be assessed.

Resources

To accumulate information on northern resources and to prepare a resources inventory as a basis for promoting development; to devise policies for the disposition of oil, gas, minerals, timber, and land; to extend services and co-operation to other agencies engaged in northern development; in general, to promote the optimum development of resources consistent with sound resources management practices, and with the protection of the public interest.

Welfare

To develop suitable programs of social security, public assistance, and related services for family and child welfare; to assist native

people in meeting economic and social changes associated with the decline of traditional ways of life, and with the shift to wage employment and life in the settlements; to encourage citizen participation in the solution of local community problems, and in the general management of community affairs; to promote the social, economic, and cultural advancement of northern peoples.

Review of 1964 Operations

Operations in the field are described separately for each District, except for the work of the Resources Division which is covered in a separate section. In Ottawa, operations were centred on planning, and on support of the various field undertakings. The Industrial Division took the first steps toward a broad program of assistance to industry. A market testing program on a number of new canned seal and whale products was completed. Marketing services for Eskimo arts and crafts produced by co-operatives and by training and experimental projects resulted in a record volume of sales through the Ottawa Craft Centre, of more than \$1000,000. In the Engineering Division, plans were made for the standardization of electrical services, and for the incorporation of new construction materials and techniques.

Plans for 1965

Planning for 1965 is directed toward the realization of the long-term goals outlined above. Further steps will be taken toward decentralization of administration to the field. In line with this proposed development, plans for 1965 are outlined in sections dealing with the District Offices.

OFFICE OF THE ADMINISTRATOR OF THE ARCTIC

Responsibilities To implement in the Arctic District the policies of the Department, as directed by the Northern Administration Branch headquarters.

Long-term Plans

Long-term plans are dependent on Departmental policy.

Review of 1964 Operations

Organization

Three Regional Headquarters were maintained. The Regional Office at Churchill supervised area offices at Eskimo Point, Whale Cove, Rankin Inlet, Baker Lake and Coral Harbour. The Regional Office at Frobisher Bay supervised offices at Cape Dorset, Hall Beach, Igloodik, Pond Inlet, Pangnirtung, and Broughton Island. The Regional Headquarters for Arctic Quebec continued to operate in Ottawa, supervising area offices at Great Whale River, Port Harrison, Povungnituk, Sugluk and Fort Chimo.

The Arctic District Office is made up of seven sections: Education, Engineering, Welfare, Industrial, Personnel, Financial Administration, and Property, Building and Equipment.

Administration

During the year Strategic Air Command withdrew from Frobisher Bay and released their accommodation and many facilities to the Department of Northern Affairs. The main structure is now known as the Federal Building. With this transfer, the department assumed greater responsibility for co-ordination of government activities at Frobisher Bay, especially those relating to pooled housing, municipal utilities and maintenance of buildings. Plans are also under way to establish transportation and other services, and a single supply agency.

Economy of the District

Throughout the year permanent wage employment remained fairly constant although at a relatively low level. Employment on the DEW Line was steady. The exodus of Eskimo miners formerly employed at the nickel mines at Rankin Inlet continued, with several obtaining employment in mines at Yellowknife and at Lynn Lake, Manitoba.

Efforts continued towards the development of local resources which might provide a source of income alternative to wage employment. Commercial fisheries were operated in the Ungava area, Frobisher Bay and Daly Bay. The latter project was a new one intended to make use of the fish resources in a hitherto untapped area. Logging projects were continued at George River. The production of art work and of handicrafts continued in the majority of communities, most significantly at Baker Lake, Cape Dorset, Povungnituk, Rankin Inlet, Great Whale River and Fort Chimo. It was Fort Chimo which produced the first Ookpik.

The number of white fox trapped increased over 1963, as did the number of sealskins produced. The price of both pelts remained reasonably steady.

Education

Ninety-six elementary classrooms, one high school classroom, nine special classrooms and three vocational shops were in operation in 31 schools. Total enrolment was 2,024 students, comprising 1,847 Eskimos, 50 Indians, and 127 others. Of particular importance was the take-over of educational facilities at Fort Churchill from the Department of National Defence.

Recruitment of a District Supervisor of Adult Education gave new impetus to this field of operations. The Supervisor was able to visit a large number of communities to assess the needs and potential, and to arrange for additional courses by contract instructors. Homemaking, sewing, cooking, and handicrafts were a few of the courses offered.

Eskimos from the District were trained in southern training schools in the following occupations: heavy equipment operation, outboard motor repair, barbering, carpentry and clerical work. In the Territories, training was carried out in power plant operation, carpentry, caretaking, sawmill operation, oil burner maintenance, and fish filleting. A placement officer was appointed to Churchill to be responsible for the selection and placement of trainees in the Keewatin Region.

An orientation course was conducted in August for newly recruited teaching staff and, in addition, teachers' workshops were held early in the year at Churchill, Frobisher and Great Whale River to enable teachers to study various problems and improve teaching methods.

Engineering

Twenty-five buildings were erected, including four large heated warehouses, two 2-classroom schools, three garages, two power-houses, one 2-bedroom and three 3-bedroom houses, an arts and crafts store, four 8-pupil hostels, a one-classroom addition, transit centre, warehouse/workshop, and a small experimental prefabricated one-bedroom house erected on N.R.C. property in Ottawa.

Consulting Engineers completed their design of a new type of freezing unit incorporating electrically-driven compressors. Three were built and shipped to Port Burwell, George River and Payne Bay. At Payne Bay diesel-electric and new refrigeration equipment weighing over 20,000 pounds was moved two and a half miles from the airstrip to the settlement with the aid of local people and their dog teams.

New diesel generators of 50 and 60 k.w. capacity arrived at five northern sites. New 3-phase 600-V. distribution systems were completed at three settlements, and at two others there were major extensions to the existing power-lines.

The centre of largest activity was Frobisher Bay, where work stretched well into the winter. Phase One of the original development plan for Frobisher was completed by private contractors and, through the Department of Public Works, turned over to this Department. Phase One provided the settlement with a new hospital, water-treatment plant, water supply and sewage disposal systems, all interconnected with utilidors.

A prefabricated oil-fired metal and brick incinerator was shipped into Baker Lake. It is hoped that its consumption of 250 pounds of moderately wet garbage per hour will be adequate and that its use will result in a big improvement in the appearance of this settlement.

A sauna Bath was purchased for Igloolik. The unit arrived too late for concrete to be poured, but the erection by volunteer labour under supervision should be able to start in late March.

Minor projects under \$5,000 were of wide variety and widespread geographically. They vary from wiring improvements in Baker Lake to classroom alterations in Fort Chimo; from plumbing renovations in Povungnituk to drainage of a swamp in Whale Cove. The list was topped by completion of the installation of new oil-fired furnaces in five

buildings and included many general construction items such as shelving, porches and storm windows.

Once again new vehicles and equipment were purchased to improve transportation and provision of essential services in various communities. They include three bombardier snowmobiles and one muskeg tractor, five trucks, four skidoos, four farm-wagons, and four Nodwell RN 75's (fully tracked combination oil and sewage service vehicles). Four Case 1000 bulldozers were purchased for road and building construction.

Industrial

Fisheries were conducted by the Eskimo Co-operatives at Fort Chimo, Great Whale River, George River, Payne Bay and Whale Cove. The Co-operative at Fort Chimo fished the areas of the Whale and Koksoak Rivers for salmon, and Leaf Bay for Arctic Char. The Co-operatives at George River, Payne Bay and Whale Cove fished exclusively for Arctic Char, and the Great Whale River Co-operative for Arctic Char, Trout and White Fish. Processed fish from George River and Payne Bay, also fresh fish from Fort Chimo, were shipped to southern markets. Fish from Whale Cove and Great Whale River were sold locally. A new fishery was established in Daly Bay and a cannery was constructed to process the catch for southern markets. Experimental seal fishing was carried on at Grise Fiord with satisfactory results. The seal fishery at Port Burwell suffered because of adverse conditions and the take was below the expected numbers. Whale fishing, carried on by the Whale Cove Co-operative, was a success with a seasonal take of 220 whales (Beluga).

The specialty food project was carried on in the Whale Cove and Daly Bay areas. The project at Daly Bay, although experimental, was successful in processing Char samples for the southern markets. The Whale Cove project was successful, and several varieties of seal and whale products were canned for human consumption. The produce will be distributed to northern settlements in the Keewatin, Arctic Quebec and Frobisher Bay Regions for sale among the local residents. The waste products and oils from the raw produce were refined into dog food for use in the Keewatin Region.

Logging was carried on at George River and Fort Chimo. Part of the lumber produced from these operations was sold locally to the Department for construction purposes. The balance was either used by the

Co-operatives for construction or stockpiled for future sales.

A new name was added to the growing list of Arctic Co-operatives with the formation in May of the Payne Bay Fishermen's Co-operative Association. This organization is affiliated with the Quebec United Fishermen's Co-operative Association.

Large quantities of handicrafts, carvings, and prints have been sent to southern markets where they are being purchased by people from all walks of life. Crafts specialists at Baker Lake and Rankin Inlet have been successful in creating new designs for the modern market. A handicraft development officer has been active at George River and Payne Bay, assisting the local people in the development of handicrafts. Experiments in the production of ceramics are being carried out in Rankin Inlet with favourable results. The highest achievement was the acclaim of the public for the Baker Lake handicrafts which were displayed in Winnipeg during November. The success of this exhibition has created new interest in Eskimo handicraft, especially items from Baker Lake.

Trapping projects were carried on in the Rankin Inlet and Whale Cove areas of the Keewatin, and at Fort Chimo in Arctic Quebec. The fur returns in the Keewatin took an upward trend as a result of the assistance given to the Eskimo trappers.

Five boats were purchased by Eskimo hunters under the Small Boats Assistance Program. Of this number, two were 40 foot longliners, two were 29 foot trap boats; the fifth was a 31 foot trap boat. One 40 foot departmental longliner was delivered to Sugluk during the summer. This vessel will be used to assist the local population in resource harvesting. The Great Whale River Canoe Project turned out several canoes of good quality. The number of orders for these canoes is increasing, and the future of this industry is most promising.

Ninety-two 1-room, twenty-two 1-bedroom, five 2-bedroom and eleven 3-bedroom houses for resale were purchased, and the majority of these were shipped to the sites and erected, some under supervision of the Area Administrators and others with the help of construction crews on site at the time.

Welfare

The District Welfare Service operated with several vacant positions on

its establishment. In August an Area Social Worker was sent to Frobisher Bay to replace the Acting Regional Superintendent who was reassigned to the Arctic District Office. In November a Regional Superintendent was appointed for Frobisher Bay, followed in December by a Welfare Assistant. This became the first time in almost two years that the Welfare establishment at Frobisher Bay had been close to its authorized strength. The Rehabilitation program was also hampered because of several vacant positions and it was necessary to discontinue the main rehabilitation function in July. All rehabilitants were graduated, placed in employment, or discharged. Competitions were later started to recruit a Superintendent and a Clerk Typist, and in November an Arts and Crafts Instructor was appointed. The complete rehabilitation program was being reviewed in order to implement changes in keeping with emerging conditions.

The Regional Superintendent of Welfare, Churchill, was seconded to Administration for several months during the year to act as Regional Administrator. He was the only Social Worker for the region and this made it difficult to provide adequate Welfare services. An Area Social Worker arrived in Churchill in September. This was the first time in over two years that this position had been filled.

Welfare services for Arctic Quebec were supervised by District welfare staff, while field operations were performed mainly by Northern Administrators and Teachers. A Social Worker participated in the Arctic Quebec annual patrol and dealt with welfare problems in all settlements.

Approximately 500 Eskimos were repatriated to Baffin Island and Arctic Quebec; after discharge from hospitals in Eastern Canada. Several hundred more were returned to Keewatin. Transient facilities at Churchill and Frobisher were used extensively throughout the year.

Case-work service was provided to most of the Eskimos in the south. This included several hundred personal interviews with tubercular patients in Moose Factory, Roberval and Weston. Eighty Eskimos undergoing treatment in Montreal for conditions other than tuberculosis were also served. Prisoners at the Rideau Industrial Farm were visited as were all retarded children in the south. Reports and photographs were sent to their relatives. A constant review was carried out to determine if the Eskimo children in southern foster homes could be returned to the north. The Social Workers in the north assisted with problems of chronic truancy and community council work,

and helped the courts in dealing with non-support charges and other problems. Plans for the retraining of two blind Eskimos and rehabilitation plans for four former psychiatric patients were made.

Ten non-Eskimo families were helped to adopt children. Several of these were Inter-Provincial adoptions. A number of Eskimo custom adoptions were also processed. A fair number of Eskimo children were placed in non-ward care in foster homes, both in the north and in the south. In addition, greater emphasis was placed on trying to obtain suitable foster homes in the north. In Churchill, work started on evaluating foster homes which would be licensed by the Province of Manitoba. Group activities were started for the youth of Akudlik.

A social worker and assistant accompanied the Eastern Arctic Medical Patrol aboard the C.C.G.S. "C.D.Howe", which visited 36 settlements and remote Eskimo camps in a period of ten weeks, and gave medical and dental service to 2,826 Eskimos. The social worker planned the evacuation of 48 Eskimos (26 with suspected tuberculosis and 22 for other medical conditions), and made provision for 18 families, including 65 children, because one or both parents were going to hospital. An occupational therapy program was provided for patients on board the ship. Reports were made to relatives of patients in southern hospitals. Two hundred reindeer skins were distributed in the settlements, together with 7000 pounds of dog food donated by the Ontario Humane Society.

Fifty Welfare houses, complete with furniture, were erected and assigned to indigent Eskimos. Allocation of these houses was in accordance with the greatest need as expressed by field officers. The smartly designed Arts and Crafts store at Akudlik was completed and opened for business.

The Welfare Arts and Crafts program was continued, and resulted in \$70,000.00 being paid to Eskimo artists. This helped, but did not greatly reduce the amount of Social Assistance which was issued. Most of the Social Assistance went to old persons, widows, the partially disabled, and others who found themselves in settlements with few or no employment opportunities. A fair number of applications for Old Age Assistance, Old Age Security, Blind Persons Allowances and Disabled Persons Allowances were processed. As a result of a food cost survey Welfare representatives were asked to issue Social Assistance in accordance with the newly established "lower" rate.

Plans for 1965

It is planned to adopt recommendations made by the Management Services Division following their studies, and this will result in greater decentralization to field officers especially in financial matters affecting economy, efficiency, and improved services.

It is also planned to follow through with a program for settlement survey and water and sewer investigations on Baffin Island. Consultants will be hired to visit three sites and submit their reports early in the summer of 1965. The program to install bulk oil facilities at various locations in the district will be continued, and facilities at Baker Lake and Port Harrison will be extended. Major construction planning is underway by the Department of Public Works in behalf of Northern Affairs for extended classroom facilities at Fort Chimo, Great Whale River, Port Harrison, Povungnituk and Sugluk. Freezers in seven communities will be changed over from operation by diesel to operation by electricity. It is also planned to erect twelve or fourteen 3-bedroom houses and attendant school facilities, warehouses and power distribution systems in the district.

Ninety new pupils will be brought to Churchill, for whom extra hostel space will be acquired and additional teachers and hostel staff engaged.

Experimental seal-netting operations will be continued at Grise Fiord, and will be started at Lake Harbour. Crafts projects will be continued at Baker Lake and Rankin Inlet. Logging operations will continue at George River and Fort Chimo, and produce from the George River will be used in part for a boat building project. The specialty food projects at Whale Cove and Daly Bay will be continued, and plans and specifications are being drawn up for a new specialty food processing plant at Whale Cove.

There will be a new emphasis on rehabilitation of Eskimos and on child welfare, including adoptions and child protection. Long range welfare programs will be continued.

OFFICE OF THE ADMINISTRATOR OF THE MACKENZIE

Responsibilities

To implement in the Mackenzie District the policies and programs of the Department, as directed by the Northern Administration Branch headquarters.

Long-term Plans

Long-term plans are dependent on Departmental policy.

Review of 1964 Operations

Organization

The Mackenzie District Office is situated at Fort Smith. The District is composed of three administrative regions with headquarters at Fort Smith, Yellowknife and Inuvik. Area offices are located in Fort Smith, Hay River, Tuktoyaktuk, Fort Simpson, Coppermine, Cambridge Bay, Spence Bay, Aklavik, and Inuvik.

General

The mid-part of the year was marked by severe forest fires, resulting in a cost of suppression which was the highest in ten years. Although the acreage burned was about one-half that of 1961 - the most recent year for extensive forest fires - the 1964 unit cost was more than double the 1961 unit cost of fire suppression. Approximately three-quarters of the fires were caused by lightning.

District administration was carried on by a network of regional and area offices along the Mackenzie River system to the Arctic Ocean and thence eastwards. Several resource development projects operated successfully during the year in the Cambridge Bay and Mackenzie Delta areas.

The muskrat crop was down by approximately 30% from the 1963 figure. The Mackenzie Delta area was hardest hit with a drop of 50%. Despite the reduction in muskrat take, yield of other furs held up well and the total value of fur production increased by approximately 15%. A better than average caribou calf crop is indicated by surveys. Anthrax again broke out in the buffalo herds near the Slave River and spread into the southern regions of Wood Buffalo Park. The mortality from the disease was 357 animals, a somewhat higher figure than in previous years. Owing to flood conditions in the Sweetgrass area 200 buffalo are known to have drowned. The buffalo calf crop was on a par with previous years.

Territorial Mortgage Loans totalled \$168,000. Loans were made for three houses in Inuvik, four at Fort Simpson (one being the first treaty Indian to obtain housing through the fund), thirteen at Fort Smith and four in Hay River. All loans were for the maximum amount of \$7,000. The N.W.T. Council received requests from residents that the fund be increased to allow for \$9,000. loans. This proposal was being given serious consideration by the Commissioner at the end of the year. In Inuvik a group of Eskimos and white citizens, spurred on by the success of their predecessors in 1963 joined the Innuite Co-operative and built an additional eight houses.

Municipal Councils at Yellowknife and Hay River continued their development plans and early in the year Fort Smith became incorporated as a village. Great interest was shown in this type of municipal organization by the residents of Fort Simpson, who took preliminary steps to become incorporated.

Education

Enrolment increased to 4,683 students in schools operated by the Department. Other schools were operated by the Public School District at Yellowknife and by Separate School Boards at Yellowknife and Hay River. A new school was opened, in temporary quarters, at Pine Point, and schools were re-opened in the Fall at Tungsten Mine and Wrigley, both of which had been closed during the previous term. The school at Arctic Red River was closed because of small attendance.

A new wing was opened at Sir John Franklin School in Yellowknife, and temporary classrooms were put into service at Hay River and Inuvik.

Twenty-two students qualified for and received financial assistance for higher education at universities, under the Territorial assistance program. A total of forty-four students were assisted to attend various vocational courses outside of the Northwest Territories, most of them in Alberta. Vocational courses were presented at various locations in the District, and were attended by forty-three trainees. A total of nine applications for assistance under the Canada Student Loan Program were processed for District residents.

A training-on-the-job program provided assistance to six persons in obtaining placement. In addition, six persons enrolled in an apprenticeship program, to learn various trades.

Adult education courses were carried on in most settlements. Twenty-five courses were provided with contract instructors, and had a total

enrolment of about 170 students. Other evening courses were conducted by community teachers in most settlements, with an average enrolment of six students and generally a good degree of interest shown. The showing of N.F.B. films, coupled with meetings and social evenings provided a supplement to the adult education program.

Engineering

Planning and development of the Pine Point settlement was completed, and further progress made on the redevelopment of Hay River.

Public Utilities

In Fort Smith, extensions were made to the water and sewer lines, and the sewage lift station was completed. Twenty buildings were connected to the water and sewer lines, eight of them buildings being erected by Alberta Trailer Company under contract to the Department of Public Works for accommodation of government personnel. In addition, two buildings were connected to the water line only, and two other buildings were connected to the sewer line only.

In Rae, water and sewer and treatment plants were completed and a system of water distribution and sewage collection was established to serve part of the settlement.

In Hay River, ground exploration was conducted to find a source of potable domestic water, but the search was unsuccessful. The consultant firm recommended a water intake line from Great Slave Lake and a system of water and sewer lines. The complete system would cost approximately \$1,000,000. At six other settlements, pump-out tanks were installed, and extensions were made to the utilider system at Inuvik. Construction was begun, or improvements made, to sixteen power distribution systems.

Settlement Fire Suppression

In Fort Smith, a fully-automatic fire alarm system was completed using a 7½-horsepower siren installed on the roof of the Joseph Burr Tyrrell school and a 3-horsepower siren on the water treatment plant with recording equipment in the Village Fire Hall.

In Fort Simpson a new $7\frac{1}{2}$ -horsepower fire siren was erected near the Northern Canada Power Commission powerhouse. It is manually operated through the C.N.T. settlement telephone system.

Fire alarm systems are at various stages of completion in Aklavik, Cambridge Bay, Coppermine, Fort Good Hope and Fort McPherson.

Road Construction

On the Hay River-Pine Point-Fort Smith highway, abutments were completed for the highway bridge over the Hay River. The contractor is waiting delivery of steel, and completion is scheduled for October, 1965. Grading and laying of base gravel was completed from the Hay River highway junction to Pine Point and on this section of the highway, bridges were built over Sandy Creek, Birch River, Twin Creek, and Big Buffalo River. The section from the Buffalo River to Fort Smith is cleared throughout and is now being used for winter travel. Possible bridge sites over the Little Buffalo River and Salt River were investigated.

On the Fort Smith-Pine Lake-Peace Point road through Wood Buffalo Park, bridge sites over two Salt River crossings were investigated preparatory to replacing the existing wooden bridges and culverts with concrete bridges to eliminate persisting annual wash-outs. An estimated cost of the proposed program is \$2, 620, 000.00.

Buildings

Materials were ordered or construction begun on the following buildings:

- 12 - 3 Bedroom houses
- 1 - Transient building
- 1 - 6 Unit bunk-house
- 2 - Low-rent houses
- 1 - Rehabilitation Store
- 1 - Rehabilitation Centre
- 1 - R.C.M.P. Office and Transient building
- 2 - 512 Cabins
- 2 - 4 Classroom schools
- 2 - 2 Classroom schools
- 2 - 1 Classroom schools
- 10 - Additions to schools
- 7 - Warehouses

Construction was completed on the following buildings:

- 1 - Transient Centre
- 1 - 4 Unit Apartment building
- 1 - 3 Unit Apartment building
- 3 - Rehabilitation Centres
- 2 - Temporary classrooms
- 1 - 5 Classroom school
- 2 - Warehouses
- 1 - Grader shelter
- 2 - Garages

Miscellaneous work connected with other buildings included the following:

Partial completion of two additional apartments
Renovation of single quarters
Construction of a basement under a residence
Preliminary work on the Territorial Jail
scheduled for completion in 1965-66
Construction of a common room in a rehabilitation centre
Improvements to a hostel
Demolition program completed at Aklavik
Repairs and additions to six garage units
Construction of nine other buildings for assorted purposes.
Piling completed at Inuvik for D. P. W. and private buildings.
Completed relocation of forest and game office at Hay River.
75% completion of bunk-houses, buffalo corrals, towers,
cabins, toolsheds and fencing for the game section.

Three wharfs were repaired and installed for aircraft and small boats and a canal was dredged at Boot Lake.

Industrial

Summer fishing projects of various types were again carried out in the Mackenzie Delta. The frozen whitefish fishery was the most successful and the product was put on sale for local consumption in the Inuvik area. A contract employee spent some time at Herschel Island evaluating the possibilities of using a seal trap to hunt seals in larger numbers. An experimental herring fishery was again conducted with the product evaluated in the south in an effort to determine if an export market could be built up.

The fishing camps on Great Bear and Slave Lakes were again popular and controversy was stirred up over the char fishing on the Tree River. Throughout the year a number of newspaper and magazine articles on travel in the Northwest Territories appeared. Additional publicity was gained through the charter of a bus carrying newspaper correspondents from the south to Yellowknife over the Mackenzie Highway. An additional item of interest to the traveller to the north was the erection of a cairn at the Alberta/N.W.T. border signifying the crossing of steel for the first time into the Northwest Territories. During the summer a further survey of possible canoe routes was undertaken along the Mackenzie River system. A major transportation company announced plans during the year for the construction of a cruise ship to ply the Mackenzie from Hay River to the Arctic Ocean.

Welfare

Child Welfare Program

The Department's Child Welfare Program continued to expand throughout the year. In any given month there were between eighty and one hundred wards and non-wards in care. The number fluctuates with children reaching the age of sixteen or being returned to their parents.

Children's Receiving Homes continued to operate in Yellowknife, Inuvik and Fort Smith. These units have now become an integral part of the Child Welfare Program and serve to ease, in part, the acute shortage of children's resources available in the District.

Social Assistance Program

Federal Social Assistance to Eskimos continued to rise. This increase is due to lack of wage employment, an extremely poor trapping season in some areas, and an increase in the overall Eskimo population. Unless adequate alternatives to Social Assistance can be introduced, costs will continue to rise.

Territorial Social Assistance appears to be levelling off after reaching a peak in 1963-64. If Community Development Programs are expanded to include the Metis, there is reason to believe that this levelling off will continue.

Medical Social Services

With a Social Worker based in Edmonton, medical social services to returning patients continued to expand and improve. It is hoped that this trend will continue as a number of gaps still exist.

A new Transit Centre opened during the year in Cambridge Bay. This unit will accommodate six to eight people plus house parents. Combination transit centres and receiving homes continued to operate in Inuvik and Yellowknife.

Correctional Services

Plans are moving ahead for the medium security jail in Yellowknife. Completion date is set for December, 1965.

It is the considered opinion of many in the District that juvenile delinquency, which was almost non-existent a few years ago, is beginning to make itself felt.

As no juvenile detention facilities are available in the District, a survey of vacant buildings was conducted in the Great Slave Lake area with the idea of securing temporary facilities. Several possibilities are being reviewed at the present time.

Rehabilitation Services

The Rehabilitation Unit located in Inuvik continued to function. At the year's end, rehabilitation services in the District were being assessed in terms of actual need and priorities. Although the assessment is not complete, there are some indications that the acute need that existed for rehabilitation services in the past may have been met over the past few years.

Specific Highlights

In October a Co-operative Development Officer, under contract to the Territorial Government, took up residence in Fort Resolution. This officer will act as a catalyst in the social and economic development of the settlement. It is too early to evaluate results, but initial reports are encouraging. Possibilities in economic development include lumbering, fishing and gardening.

A pilot program, termed the Community Development Fund, was introduced in the District. This program provided \$17,500.00 for community development projects. Decisions to undertake specific programs came from the people in specific areas with Regional and District Offices providing broad guide lines. Most of the funds have been committed to a number of projects and there is every indication the program will be a resounding success.

Plans for 1965

Low cost housing schemes, subsidized by the Federal and Territorial Governments are again likely to play an important part in improving living conditions of the residents of the North.

The first steps will be taken this year for the co-ordination of all departmental activities in the District. School facilities are planned for Holman Island - delayed a year because of severe ice conditions along the Arctic coast - and Inuvik, where a high school and accompanying hostel are to be built. At other centres, school facilities will be expanded to accommodate the expected increase in school enrolments.

The Tuktoyaktuk Fur Garment Project launched with the assistance of Vocational Education will likely be incorporated, sometime during the year, as the second fur garment project in the western Arctic. A tannery course for the tanning of fine fur, particularly muskrat, is planned for the settlement of Aklavik to supply the projects with fur. Curriculum planning is now under way for the introduction of a two to three year course in boat building and maintenance at Inuvik.

Hydro electric power will flow through the transmission cables connecting Taltson River with the mining development at Pine Point during the latter part of the year. Work on the construction of the all-weather road from Fort Smith to Pine Point will commence, using in part the allowance cut for the transmission line. Survey of development roads and general road construction at various settlements will again be carried out.

Industrial Division sponsored projects, including resource harvesting and co-operative development, are expected to again play an important role in the economy of the District. The study of Fort Resolution by the Co-operative Union of Canada under contract to the Territorial Government promises to assist greatly in the development of that settlement. An attempt will be made to locate and harpoon the bowhead whales which, it is reported, are found in large numbers in the Beaufort Sea.

An increase in tourist traffic is expected and the fishing camps will continue to draw sportsmen from all parts of North America. The number of campsites and picnic grounds along the Mackenzie Highway System will be increased and work will continue on the marking of canoe routes.

Production of arts and crafts will continue, and new craft production will begin in areas not yet exploited.

REVIEW OF 1964 OPERATIONS

RESOURCES DIVISION

OIL AND GAS

Land Disposition

A total of 1,922 Canada Oil and Gas Permits covering 125,037,238 acres were issued; of this, 326 permits covering 14,307,527 acres were in the Northwest Territories; 61 permits covering 2,713,298 acres were in the Yukon Territory; 127 permits covering 7,634,250 acres were in the Arctic Islands; and 1,408 permits covering 100,382,163 acres were in coastal waters. The total acreage under permit and lease on December 31, 1964, was:

Permits

Northwest Territories (mainland)	999	46,109,382
Yukon (mainland)	334	13,622,569
Arctic Islands	1,063	49,771,932
Water	<u>1,856</u>	<u>137,374,058</u>
TOTAL	4,252	246,877,941

Leases

Northwest Territories (mainland)	30	137,135
Yukon (mainland)	<u>3</u>	<u>13,220</u>
TOTAL	33	<u>150,355</u>

<u>Acreage under permit and lease</u>		<u>247,028,296</u>
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Three cash bonus permit sales were held during the year. A total of 13 permits were sold realizing \$95,306.72.

Thirty-one blocks covering 174 grid areas were disposed of,

realizing a work bonus commitment totalling \$6,706,239.31. This sum has to be expended on exploratory work during the first term of the permits in order to be refundable.

Exploration

Mainland

Geological surveys by the oil industry decreased in 1964. Approximately 20 geological parties continued extensive investigation of the stratigraphy and structure in the sedimentary ranges of the Mackenzie and Richardson Mountains in the Northwest Territories and on the Eagle Plains in the Yukon. Helicopter and light plane support aircraft have reached their maximum utilization as all supplies and personnel are transported to and from the field by plane and all surface investigations are carried out by helicopter-borne parties. Approximately \$1 million was spent on this exploratory phase, a major portion on helicopter and plane contracts.

Light mobile geophysical equipment continued to be used and adopted for muskeg and highly dissected terrain. During the past year, two companies utilized seismic equipment as part of their exploratory work. The cost is comparable to conventional seismic methods as the amount of trails and seismic lines are reduced approximately by half. The major cost item is helicopter contracts.

Results from stratometer surveys in the Mackenzie Delta and the Mackenzie River have not been good. This is due to current noise combined with a thick layer of silt and sediment overlying bedrock. Marine seismic surveys were continued on the east and west coasts of Canada. A magnetometer survey was completed on the Grand Banks. A gas well was completed in the Beaver River area. One significant test was completed in the Eagle Plains area which resulted in a gas discovery. One gas discovery was also made in the Liard Basin.

Arctic Islands

The number of surface geological parties remained the same in 1964. A well on Bathurst Island was completed to a total depth of 10,500 feet without finding oil or gas.

Regulations

Several amendments to the regulations pertaining to the

disposition of oil and gas under Canada lands were promulgated. The most pertinent amendment was in regard to size of groups and disposition of acreage within a group.

Publications

The third comprehensive "Schedule of Wells 1920-63" was completed in 1964. This Schedule contains all the geological information and drill stem tests on wells completed to the end of 1961. Various specialized maps and information circulars were printed for sale for distribution to the oil industry.

MINING - YUKON TERRITORY

The total value of mineral production for 1964 is estimated to be approximately \$15,210,744.00. The value of gold increased, whereas the value of silver produced in the Yukon decreased in both quantity and value.

Exploration activity has been at the highest level for the past several years and mining companies seem to be very optimistic regarding the expansion of the mineral industry throughout all of northern Canada in 1965. Since the turn of the century, development of minerals in the north has centered around gold. However, in recent years, there has been a trend to diversify and exploit other minerals including copper, nickel, asbestos, silver, lead and zinc. Due to increased mineral prices, improved transportation, new markets, and new techniques employed in exploration and development, together with the stable market price of gold, mining companies have been encouraged to exploit base metal deposits. Since silver is usually associated with lead and zinc in the Mayo Mining District, and the price has risen from 80¢ to over \$1.25 per ounce, many mining companies have become active in this District. Most of the Yukon is mantled by overburden and outcrops of rock are rare, except in the high altitudes. Geophysics seems to be playing an increasing role in the location of potential mineral deposits. Recently, geochemical techniques have been tested on soils and stream waters, including areas favourable for silver, lead, zinc deposits and it is expected that this method of tracing locations of mineralized zones in areas covered by overburden has great promise for the future. Markets are constantly developing for asbestos and iron and, during 1964, a combined geophysical and diamond drilling program was successful in outlining additional reserves of short

fibre asbestos, for the cement industry, in the area west of Dawson City. Feasibility studies were conducted jointly by the government and the Canadian National Railways on the possibility of building a railroad to exploit the vast iron deposits in the Snake River area. Work continued on the Whitehorse copper belt where Japanese interests have been assisting to defray the costs of outlining a potential copper-iron-silver deposit. Consideration is now being given to the construction of a 2,000 ton mill to concentrate the ore for shipment to a custom smelter. A promising zinc deposit was discovered during 1964 in the Tyers River valley area north of Watson Lake. Preliminary diamond drilling is expected to commence during the season of 1965 to outline the economics of developing this deposit. There was a greater number of individuals recovering placer gold from many of the known creeks where placer gold can no longer be mined profitably by hand methods. Individuals now use bulldozers and sluice boxes and seem to be able to make a comfortable living.

The Prospectors' Assistance Program was stream-lined to include an advance at the beginning of the season at which time prospectors require a grub-stake to commence their season's activities. This was favourably received and consideration is now being given to completely decentralizing the administration of the Program by enactment of regulations which would make it possible for those participating in the Program to receive assistance at the local level.

The Tote Trail assistance fund, made available by the Federal Government to the Yukon Territorial Government, assisted many small companies to build roads for the purpose of mineral exploitation. At the year end, the fund was completely exhausted and more applications than monies available were on hand.

The following table shows the number of mineral claims recorded in 1964:

<u>Mining District</u>	<u>Quartz</u>	<u>Placer</u>	<u>Total</u>
Whitehorse	1365	24	1389
Mayo	495	46	541
Dawson	51	89	140
Watson Lake	<u>349</u>	<u>Nil</u>	<u>349</u>
TOTAL	2260	159	2419

The following table shows mineral production for 1963 and 1964.

<u>Mineral</u>	<u>1963</u>		<u>1964</u>	
	<u>Quantity</u>	<u>Value</u>	<u>Quantity</u>	<u>Value</u>
Gold	55,211 ozs.	\$ 2,084,215	57,075 ozs.	\$2,154,581
Silver	6,106,037 ozs.	8,450,755	5,584,497 ozs.	7,818,296
Lead	16,978,607 lbs.	1,867,647	18,927,109 lbs.	2,543,803
Zinc	11,850,706 lbs.	1,514,520	14,291,939 lbs.	2,025,168
Cadmium	135,885 lbs.	326,124	192,522 lbs.	577,566
Coal	<u>8,231 tons</u>	<u>123,675</u>	<u>6,792 tons</u>	<u>91,330</u>
TOTAL		\$14,366,936		\$15,210,744

NOTE: Calendar year only

MINING - NORTHWEST TERRITORIES

The value of mineral production increased in 1964 due primarily to a higher grade of gold ore being mined. The railroad to Pine Point was completed well ahead of schedule and shipments of good grade lead-zinc ore were made for testing purposes. Diamond drilling to further outline the mineral deposit was continued during the year, as well as stripping operations in preparation for open pit mining. Buildings were erected to house personnel and preparations were made for mill construction which should be completed to coincide with the availability of power from the Talston River to enable the mine to produce a concentrate in the fall of 1965.

The tungsten mine in the Nahanni Mining District re-opened in September after it had negotiated short term contracts on a fixed basis. The mill circuits had to be completely reoriented and until metallurgical and mechanical difficulties are overcome, full scale production will not commence. Some tungsten concentrate was produced in 1964 which will be used primarily for testing purposes.

Exploration for gold continued at a high level in the Contwoyto Lake area and in the vicinity of Coronation Gulf. A fire in the hoist room of the Con Mine early in the year forced a temporary shut-down, although development work continued underground until resumption of production during the summer. Discovery Mine expected to cease production last fall but early in the year, underground exploration revealed an extremely high-grade gold showing which was developed and, to date, has succeeded in establishing ore reserves for at least another four to five years. Further development could substantially increase ore reserves.

Tundra Mines commenced production last spring with a limited life expectancy of four to five years. Additional diamond drilling of the Mary River iron deposit on Baffin Island revealed at least 118,000,000 tons of direct-shipping iron ore and feasibility studies are now being conducted on the possibilities of bringing this mine into production. Negotiations for financing and marketing are presently underway and, if a production decision is made, it is expected that 2 million tons annually will be stock-piled for a four-month shipping season, provided ice breaker support can be obtained.

A silver property was developed underground in the Great Bear Lake area where a small mill was established to produce about 10 tons of concentrates daily which will be shipped over a winter road to Hay River and thence by railroad to a custom smelter. This will be a small-scale seasonal operation unless reasonable ore reserves are established through underground exploration and development.

The Prospectors' Assistance Program attracted many individuals, contributing to a successful season of exploration throughout many areas.

Approximately \$36,000 was expended on Tote Trail assistance to encourage mineral resources exploitation.

The following is a table of mineral claims recorded during 1964 in the various mining districts.

	<u>Quartz</u>
Mackenzie Mining District	3949
Nahanni Mining District	76
Arctic and Hudson Bay Mining District	<u>222</u>
TOTAL	4247

NOTE: Calendar year only

The following table shows mineral production for 1963 and 1964.

<u>Mineral</u>	<u>1963</u>		<u>1964</u>	(<u>Preliminary</u>
	<u>Quantity</u>	<u>Value</u>	<u>Quantity</u>	<u>Value</u> <u>Estimate</u>)
Gold	387, 000 ozs.	\$14, 609, 250	416, 963 ozs.	\$15, 740, 354
Silver	77, 468 ozs.	107, 216	66, 462 ozs.	93, 047
Copper	32, 638 lbs.	10, 281	---	---
Lead	---	---	3, 690, 000 lbs.	495, 936
Zinc	---	---	6, 390, 000 lbs.	905, 463
Tungsten concentrates---	---	---	670 tons	N/A
TOTAL		\$14, 726, 747		\$17, 234, 800

LANDS

The development of the townsites at Pine Point and Hay River continued to provide the major problems in the Northwest Territories.

Modifications to the town plan have delayed the start of construction in the commercial area at Pine Point but it is expected that the changes will be completed in time to permit building to proceed during the 1965 construction season.

In the new townsite of Hay River, most of the residential lots have been disposed of and, in order to meet additional demands, a thirteen acre parcel has been made available for subdivision by the town authorities. Development of this parcel has provided approximately seventy additional lots. Commercial and shopping area lots were sold at public auction in May and, although drainage and permafrost problems have so far prevented building in these areas, it is hoped that the difficulties will be resolved in time to allow construction to commence during the summer of 1965. The administration of all lots in the new townsite has been transferred to the Commissioner of the Northwest Territories so that all revenue derived from the sale of the lots will go to the Northwest Territories Revenue Fund.

Arrangements were completed with the Department of Transport to make available land in the airport reserve required for roadbed purposes by the Great Slave Lake Railway.

To assist field office staffs, complete land registers were prepared and sent to the offices in the Mackenzie District. Copies of the Land Administration Manual were distributed to all offices in the Mackenzie and Arctic Districts.

In view of the interest displayed by cattle ranchers in the possibilities of grazing in the Northwest Territories, arrangements are being made for a comprehensive study to be carried out by the Department of Agriculture in the Slave River area where extensive grass lands have supported buffalo herds for many years.

In the Yukon Territory, land administration at the local level continues to work well. The volume of transactions is slightly lower than the 1963 figures but the decrease is not significant. Whitehorse, Porter Creek, Beaver Creek and Watson Lake continue to be the main areas of public interest.

Land Dispositions 1964

	<u>Land Sales Completed</u>	<u>Agreements of Sale in Force</u>	<u>Leases in Force</u>	<u>Total</u>
Northwest Territories	74	216	476	766
Yukon Territory	<u>98</u>	<u>189</u>	<u>430</u>	<u>717</u>
TOTAL	172	405	906	1483

Thirty-nine leasehold mortgages were registered and twenty-seven parcels of land purchased or otherwise acquired.

FORESTRY

With the exception of one new sawmill in the Grand Detour area just north of Fort Smith, the number of northern timber operations remained unchanged in the Mackenzie and Yukon. The Canada Tungsten Mine in the Mackenzie re-opened in September but until mechanical difficulties are overcome, full scale production will not commence. The sawmill of Canada Tungsten will likely then resume operations.

The forest fire season in the Mackenzie resulted in the highest fire suppression cost for the past 10 years. There were 169 fires

which burned an estimated 470,484 acres. This is a breakdown of 99 fires that burned 168,216 acres in protected zones and 302,268 acres burned from 70 fires in unprotected zones. Lightning caused 107 of these. The fire season in the Yukon was the lightest on record with only 25 fires burning a total of 480 acres. Of these, 23 fires which were fought burned only 30 acres and the remainder in inaccessible areas, which were unfought, accounted for 450 acres. This light forest loss from fire can be attributed almost entirely to abnormally cool temperatures and heavy precipitation.

Forestry Publicity and Education

An increased public relations program on forest conservation was implemented. The distribution of forestry literature as well as the forest fire prevention essay and poster contests in the schools continued to be effective. The use of the press, radio and speaking tours by Forest Services personnel have proved to be the best means of making the public fire conscious.

Plans for 1965

OIL AND GAS

Continued interest is being shown in the Peel Plateau area and in three work bonus sales. An additional \$6 million was committed for exploratory work. This should result in the drilling of 9 to 10 wildcat wells beginning in the winter of 1964-65.

Continued interest is being shown in the Liard Basin and Eagle Plains. Both areas will be further explored by drilling in 1965.

Work will continue on the Canada Oil and Gas Land Regulations and new orders may be introduced as the requirements dictate.

Work is continuing on the Oil and Gas Conservation Production Act and it is hoped that it will be introduced in the current session of Parliament.

Following promulgation of the Act, regulations will be prepared. "Schedule of Wells" No. 4 will be published; this will contain the basic information on all wells drilled to the end of 1964 and complete information on the geology and engineering of all wells drilled to the end of 1962.

MINING

Yukon Territory

Mineral exploration activity will probably remain at the same level as in 1964.

One promising gold development may come into production, although no definite decision has been made.

Japanese interests are examining a copper deposit near Whitehorse.

Additional diamond drilling and exploration will be carried out on a very promising asbestos property near Dawson.

The value of mineral production is expected to remain approximately the same as in 1964. Lower gold production will be offset by higher returns from silver and base metals due to increased prices.

The Prospectors' Assistance Program, which was fully subscribed in 1964, is expected to have another successful year in 1965.

More exploration work is expected on the base metal discoveries in the Ross River area.

Northwest Territories

It is expected that the increased exploration activity experienced in 1964 will continue into 1965.

The areas which will receive the most attention are Pine Point, Baffin Island and Yellowknife.

The major construction program for the large lead-zinc producer on the south shore of Great Slave Lake will be completed and concentrates will be produced by the end of the year.

Value of mineral production will increase with the re-opening of a tungsten property near the Yukon border.

A major program is expected for the high-grade iron ore property on Baffin Island.

One of Canada's largest mining companies will examine a lead-zinc deposit on Little Cornwallis Island.

The Prospectors' Assistance Program is expected to have another successful year.

Further exploration for gold is expected in the Coronation Gulf area.

LANDS

In the Northwest Territories, an extensive addition to Inuvik is planned and townsites are to be surveyed at Spence Bay and at Holman Island. Additional surveys resulting from re-planning at Watson Lake are to be carried out in the Yukon Territory.

FORESTRY

The annual Fire-Fighting Training Schools will again be convened in 1965 to include instruction on various phases of fire suppression.

In 1965 the Mackenzie Forest Service will have single side band radio communication at Fort Smith, Hay River, Yellowknife and Fort Simpson. Additional units will be placed at downriver locations.

Investigations have continued in co-operation with Canadian National Telecommunications on the feasibility of a VHF radio system for the Yukon. It is hoped that such a system will be partially in operation in 1965.

NORTHERN CO-ORDINATION AND RESEARCH CENTRE

Responsibilities To sponsor and conduct research on northern subjects, to encourage northern research by non-governmental agencies, to co-ordinate departmental and interdepartmental research, to collect and disseminate technical and scientific information on the north, and to operate the Inuvik Research Laboratory.

Long-term Plans

To assist in the development of the Canadian north by encouraging an increasing volume of scientific and technical investigations. To provide adequate laboratory and other facilities in the north for the use of scientists from government departments, universities, and elsewhere.

To administer an expanded program of grants to northern research institutes and northern scientific expeditions. To undertake a program of research directed towards northern needs and particularly in the social sciences.

Review of 1964 Operations

Northern Affairs Library

Over 7,000 books, pamphlets, and periodicals were held in the Library. Some 3,000 books were loaned and 2,000 enquiries received. During the year over 5,000 visits were made to the Library, and approximately 2,000 telephone calls for information were handled.

Facilities for Scientific Research in the North

The Research Laboratory at Inuvik, including an annex for cosmic-ray measurements, completed its first full year of operation. The Laboratory, a new two-storey building, contains low-temperature rooms and special arctic experimental facilities in addition to general laboratories, photographic dark room, library, offices, and seminar rooms. The manager and a small technical staff provide assistance in support of scientific investigations throughout the year.

Six of the abandoned intermediate DEW Line stations were reserved for use as required for scientific purposes.

Research Programs

Fourteen research projects were continued or initiated. Scientists were employed under contract and as seasonal employees from universities across Canada. The projects were:

1. A social and economic follow-through study of the development of the co-operatives at George River, P.Q.
2. A study of the transportation pattern in the Yukon Territory.
3. A study of Eskimo administration in Greenland.
4. A continuation of a survey of economic, social, and demographic change in the Eskimo settlements of the eastern littoral of Hudson Strait.
5. A settlement study of Dawson and the surrounding area.
6. An analysis of statistical and questionnaire material dealing with the food consumption and diet of the population of the Yukon Territory and the Northwest Territories.
7. A study to determine the feasibility of adapting existing programmed learning devices for use in northern schools.
8. A study on the development of the Yukon Government and of the Yukon Territorial Council.
9. A study of Canada's expansion to the north and related problems of sovereignty.
10. A study of child raising customs of Eskimos living in the Clyde River area.
11. A study of hunting, trapping and fishing in the Yukon Territory.
12. An exploratory study of the aged Eskimo inhabitants of several Eskimo settlements.
13. A study of comparative settlement patterns in the north.
14. An exploratory study of surface and weather conditions in relationship to the operation of air-cushioned vehicles in northern transportation.

Grants Program for Northern Research Institutes and Scientific Research Expeditions

During the third year of the program of assistance to northern research institutes and northern scientific research expeditions, amounts totalling \$120,000 were awarded, as recommended by the Grants Committee to the Minister. Grants were made to the Arctic Institute of North America, the Boreal Institute (University of Alberta), the Canadian Research Centre for Anthropology (University of Ottawa), Centre d'Etudes Nordiques (Universite Laval), Committee on Arctic and Alpine Research (University of British Columbia), Committee on Northern Studies (University of Manitoba), Institute for Northern Studies (University of Saskatchewan), Institute of Social and Economic Research (Memorial University), McGill Committee for Northern Research (McGill University), The Institute of Earth Studies (University of Toronto), The Boothia Peninsula Expedition (University of Ottawa), The Devon Island Expedition (Arctic Institute of North America), and the Jacobsen-McGill Expedition to Axel-Heiberg Island.

Reports

Three reports were issued during the year.

Plans for 1965

The Inuvik Research Laboratory will provide facilities for an increasing number of scientists.

The following projects have been proposed for investigation and will be carried out to the extent that availability of funds and qualified scientific personnel allow:

1. Continuation of the Greenland phase of the comparative study of Eskimo administration.
2. Continuation of the study of the aged Eskimo inhabitants of several eastern Arctic settlements.
3. Continuation of the regional survey of the Yukon.
4. A study of the role of working dogs in the Northwest Territories.
5. Continuation of the study of child-raising customs of the Eskimos living in the Clyde River area.

6. Continuation of the study of Canada's expansion to the north and related problems of sovereignty.
7. The initiation of a three-year social and economic study of the Mackenzie District. The study is designed to collect information on the economic, social administrative and technological problems involved in northern development.

NORTHERN CANADA POWER COMMISSION

Responsibilities To provide electrical power in the Yukon and Northwest Territories as authorized by the Governor-in-Council. To operate each plant from consumer revenue on a self-sustaining basis including repayment of capital expenditures.

Long-term Plans

Forecast and normal planning in order to establish, maintain, and expand electrical and utility requirements.

Review of 1964 Operations

Northwest Territories

Fort Smith - To augment the standby capacity of the existing 2300 kw diesel electric plant pending supply from the Taltson Hydro Electric Development becoming available, a 960 kw diesel unit was transferred to Fort Smith from Frobisher Bay and is expected to be ready for service in early 1965. The plant has a staff of 8 serving 570 consumers with a gross revenue of approximately \$276,000.

Inuvik - The electrical distribution system and the utilidor system supplying central heat, domestic water, and sewerage services were extended to 12 new buildings. The plant has a staff of 33 and serves 436 electric and 150 heat, water, and sewer connections with a gross revenue of approximately \$865,000. Electric power generating capacity of this plant is 3460 kw and steam raising capacity is 90,000 lbs/hr. Mechanical and electrical maintenance of the majority of Federal Government and a number of privately-owned premises is carried out on a contract basis.

Fort McPherson - This operation, which is maintained on behalf of the Department of Northern Affairs and National Resources, includes a diesel electric plant, a heating system, water, and sewerage facilities. Revenue from utility service to other than the Department of Northern Affairs and National Resources premises is credited against costs recoverable from Northern Affairs and National Resources. A fire in an annex to the diesel power plant damaged two generating units, one of which has been returned to service and the other is under repair. The plant has a staff of 8.

Fort Simpson - The generating capacity remains at 1075 kw. The central heating and water treatment plants and the sewerage system are operated on behalf of the Department of Northern Affairs and National Resources. Mechanical and electrical maintenance of departmental facilities at Fort Simpson, Nahanni Butte, Fort Wrigley, Fort Liard and Jean-Marie River, are carried out on behalf of the Department of Northern Affairs and National Resources. The plant has a staff of 21 serving 189 consumers; revenue from electricity sales was approximately \$135,000.

Aklavik - The electrical generating and distribution system are maintained on behalf of the Department of Northern Affairs and National Resources on an agency basis. The plant facilities have been improved by the addition of a 60 kw diesel unit, a 3000 barrel oil storage tank, the installation of 20 street lights, and continuation of the distribution system renovation project. The plant has a staff of 3 serving 77 consumers.

Frobisher Bay - The new power generating, central heating, and water treatment plants, the latter operated on behalf of the Department of Northern Affairs and National Resources, were commissioned early in the year. The power plant presently has two diesel electric sets with a total capacity of 1960 kw and a 1500 kw gas turbine unit; the latter is the first gas turbine installation in the north. The central heating plant has 2 oil fired packaged hot water generators each rated 15,000,000 BTU's per hour and a 12,000,000 BTU's per hour waste heat boiler associated with the gas turbine. On behalf of the Department of Northern Affairs and National Resources, the Commission undertook operation of the Federal Building heating and power plant. The operation has a staff of 23 employees serving 178 consumers and a gross revenue of approximately \$504,000.

Fort Resolution - This 325 kw plant continues to supply electrical service to the settlement. The plant has a staff of 3 serving 58 consumers; revenue for the year was approximately \$56,000.

Snare River - Two hydro electric plants of 8350 and 9200 hp capacity and a 90 mile transmission line supply electric power to the mining companies in the Yellowknife area and to a private utility for resale in the town of Yellowknife. This system is interconnected with the Bluefish Hydro Electric Plant owned by Consolidated Mining and Smelting Company of Canada Limited.

A Commission-owned 1000 kw diesel electric standby plant is located in Yellowknife to ensure service to the town in the event of failures in the hydro systems. Construction is nearing completion on a control centre in the town of Yellowknife for remote control of the hydro plants on the Snare River. The system has a staff of 15 and an annual revenue of approximately \$640, 000.

Yukon Territory

Mayo - A 6, 000 hp hydro plant serves the communities of Mayo, Keno City, and the mining operations in the vicinity of Elsa and Keno Hill. To provide power to Mayo during shutdown of the hydro plant for maintenance purposes, a 300 kw standby diesel unit was installed and commissioned. The plant has a staff of 8 and a gross revenue of approximately \$455, 000.

Whitehorse - This is a two-unit 15, 000 hp hydro plant supplying the Department of Public Works highway maintenance, the R.C.A.F. establishment, and Department of Transport airport at Whitehorse, and supplementing the Yukon Electric Company supply to the City of Whitehorse. Surplus power is supplied to electric boilers at the hospital and two hostels for heating. The plant has a staff of 9 and a gross revenue of approximately \$566, 000.

Plans for 1965

The following work is scheduled:

- (a) General maintenance of transmission lines and plants and extension of distribution systems as required to service new construction.
- (b) Investigation into extension of heating facilities from the central heating plant to the Federal Building at Frobisher Bay.
- (c) Construction of an office, storage, and workshop building at Inuvik.
- (d) Completion of the 25, 000 hp Taltson River Hydro Electric Development work, associated transmission lines to supply Pine Point Mines Ltd., and the Fort Smith area.
- (e) Construction of a transmission line from Yellowknife to Rae.

- (f) Construction of a new power plant at Fort McPherson.
- (g) Provision of single staff quarters at Mayo and Yellowknife.
- (h) Completion of a remote control centre at Yellowknife.
- (i) Investigation of power and heat supply for the proposed Baffinland Iron Mines development on Baffin Island.
- (j) Further studies on renovation of power and water supply utilities for Dawson City.

NORTHERN TRANSPORTATION COMPANY LIMITED

Responsibilities

To act as a common carrier of freight in the Western Arctic and in the Mackenzie River system, including Lake Athabasca, Great Slave Lake, and Great Bear Lake, under the jurisdiction of the Board of Transport Commissioners. To distribute freight by sea from Tuktoyaktuk to the DEW Line stations and to other populated areas in the Western Canadian Arctic.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1964 Operations

Tonnage handled by the Company on the Mackenzie River system during the season was 127,903 tons, an increase of 6.9% over 1963. Of this figure, 42,655 tons moved into Northern Alberta and Saskatchewan from Waterways; 18,994 tons moved from Alberta into the Northwest Territories; 13,430 tons moved southbound to Waterways, and the balance represented movements within the Northwest Territories, Alberta, and Saskatchewan. Along the Arctic Coast, general cargo and petroleum products were delivered to all points including DEW Line stations.

During the 1964 season the ice conditions in the Arctic were the worst encountered by the Company since operations were begun there in 1956. This applied to the Colville River area as well as points east of Tuktoyaktuk, with the most difficult area being that of Baillie Island through to Cape Lyon. In spite of this, all commitments were met, including delivery of approximately 5,000 tons of oil drilling equipment along the Arctic Coast to the Colville River area in Alaska.

Part of the tonnage handled on the Athabasca consisted of construction material for the Great Canadian Oil Sands project approximately 24 miles north of Fort McMurray. This movement, however, will continue only until the bridge is completed across the Athabasca River at Fort McMurray.

Water conditions in the Mackenzie River watershed were again at high levels and no difficulties were encountered in this area.

Plans for 1965

Capital expenditures are estimated at \$1,510,800 including items carried over from the previous fiscal year. The larger portion of this consists of expenditures for a new arctic supply vessel. In keeping with the Company's policy of endeavouring to offer better service, it is felt that a larger vessel than the present M.V. "BANKSLAND" is needed to serve the area. The remaining expenditures cover replacement of equipment and further development of the terminal at Hay River, tying in with the completion of the Great Slave Lake Railway.

POST OFFICE DEPARTMENT

Responsibilities Provision of mail service to and from post offices
in the Yukon and Northwest Territories.

Long-term Plans

To provide adequate mail service subject to the availability of
transportation services.

Review of operations for the fiscal year 1963-64

Transportation

The following table lists the scheduled air and surface mail transportation services on which mail was conveyed to and from the Yukon and Northwest Territories, showing the expenditures for the fiscal year 1963-64 as compared with the year 1962-63.

	<u>Yukon</u>	
<u>Air Transportation</u>	<u>1963-64</u>	<u>1962-63</u>
Dawson-Old Crow	\$ 13,614.75	\$ 8,898.95
Dawson-Stewart River	3,214.20	2,379.84
Vancouver-Whitehorse	548,111.56	489,804.13
Whitehorse-Dawson	30,242.55	25,831.25
Total	\$595,183.06	\$526,914.17

Surface Transportation

Atlin-Whitehorse	\$ 6,000.00	\$ 6,000.00
Dawson-Granville	1,820.00	1,820.00
Dawson Creek-Whitehorse	70,649.00	76,630.00
Keno Hill-Mayo	4,368.00	3,744.00
Whitehorse-Alaska Highway-Mile 1202	8,954.00	8,954.00
Whitehorse-Dawson	11,936.00	11,995.00
Total	\$103,727.00	\$109,143.00

Post Office to Airport Services	\$ 4,514.33	\$ 4,648.66
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Total expenditure for conveyance of mail to and from the Yukon	\$703,424.39	\$640,705.83
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Northwest Territories

<u>Air Transportation</u>	<u>1963-64</u>	<u>1962-63</u>
Edmonton-Mackenzie River Area	\$452,029.20	\$454,237.56
Fort Churchill-Baker Lake	69,612.29	47,145.72
Fort Churchill-Coral Harbour	9,514.80	6,169.68
Inuvik-Sachs Harbour	285.15	163.63
Inuvik-Tuktoyaktuk	963.00	813.00
Montreal-Resolute	137,757.04	125,088.13
Yellowknife-Discovery	1,462.90	1,389.10
Fort Nelson-Fort Liard	1,123.20	---
Total	\$672,747.58	\$635,006.82

Surface Transportation

Hay River-Rae	\$ 1,500.00	\$ 1,500.00
Peace River-Hay River	39,900.00	39,900.00
Total	\$ 41,400.00	\$ 41,400.00

Post Office to Airport Services	\$ 6,438.67	\$ 6,698.67
Total expenditure for conveyance of mail to and from the Northwest Territories	\$720,586.25	\$683,105.49

Mail was also despatched to settlements in the North by government and privately owned vessels, by courtesy flights of the RCAF and RCMP, and by flights chartered by other government departments.

The Christmas Air Drop was again provided by the RCAF and approximately 7000 pounds of mail were dropped by parachute to 17 settlements.

During the summer a survey was conducted into the postal activities in the North with a view to possibly coordinating mail transportation requirements with the needs of other departments. The study has been completed and meetings are now being held with representatives of other departments.

New Post Office

<u>Name of Office</u>	<u>Date Established</u>
Pine Point, N.W.T.	October 19, 1964

The establishment of post offices at Broughton Island, N.W.T. and Igloolik, N.W.T. has been authorized subject to completion of the necessary arrangements. Consideration is also being given to the establishment of post offices at Spence Bay, N.W.T. and Snowdrift, N.W.T.

Plans for 1965

To provide adequate postal service, commensurate with cost.

DEPARTMENT OF PUBLIC WORKS

Responsibilities

Site investigations, planning, and construction of buildings, highways, and bridges for both public use and to meet the requirements of other government departments. Maintenance and improvements to river routes and provision of wharves and harbour facilities as well as river bank protection. The planning and installation of sewer, water, and power services in northern settlements. The provision of architectural and engineering services to all government services as required. The acquisition, management, and control of government properties. The construction and management of federal housing in northern settlements. The development planning of townsites for larger settlements. Assistance in building research when required.

Long-term Plans

To act as architectural and engineering consultants and construction agent for the government on the effective development of northern Canada. To assist in the planning and construction of properly developed centres from which to administer and develop the North at Whitehorse, Inuvik, Yellowknife, Fort Smith, Hay River, Frobisher Bay, and Churchill, including the provision of water supply, sewage disposal system, roads, etc. To develop town plans for a number of settlements in order to coordinate effectively the future expansion and development of these communities. To continue the construction of "year round" highways northward into the Northwest Territories. To continue to maintain and improve navigable waterways and docking facilities. To establish housing standards for federal employees in northern communities.

Review of 1964 Operations

Planning and construction work was undertaken for twelve departments of the federal government. Work was started on a number of projects of varying sizes and continued on a few carried over from 1963.

PHASE 1 of the Frobisher Bay development, which included the Hospital, Water Treatment Plant, and Sewage Disposal System, was completed and turned over to the Department of Northern Affairs and National Resources.

Plans were advanced for the construction of houses, hostels, and additions to schools at Pangnirtung and Pond Inlet.

A number of houses were constructed at Fort Chimo for the Department of Transport. Projects were undertaken at Fort Albany, Rupert House, and Great Whale River for Citizenship and Immigration, National Health and Welfare, and Mines and Technical Surveys.

The control and operation of Fort Churchill was assumed from the Department of National Defence on April 1. This involved the provision of logistical support, medical, recreational, welfare, maintenance, and operational services as a continuance of the facilities formerly provided by the Department of National Defence. In addition, a major alteration program was undertaken for the Department of Northern Affairs and National Resources in order to provide school and hostel facilities. The responsibilities included administration, finance and operational services and the provision and maintenance of accommodation, land, buildings, roads, rations, sewer and water, snow removal and transportation, as well as the coordination of range safety at the rocket range with the U.S.A.F. A staff of 427 personnel has been required to carry out this program. Professional support to the Resident Engineer was provided by the District Architect, Winnipeg.

Initial surveys were completed and plans are being developed for sewer and water systems to be installed at Eskimo Point and Baker Lake. A seismograph vault was constructed at Baker Lake for the Department of Mines and Technical Surveys.

The Department is responsible for the provision of pool housing for all Government departments at Fort Smith, Hay River, Yellowknife, Fort Simpson, and Inuvik in the Northwest Territories and Whitehorse in the Yukon. There were approximately 450 houses and 125 apartments in this category. Construction was started on 26 houses and a 14-unit apartment block at Inuvik.

There was an indication of increasing interest toward capital investment in the larger centres in the north. During the past year entrepreneurs constructed a number of housing units at both Fort Smith and Yellowknife for lease to the Federal government and it is anticipated that this activity will extend to Hay River in 1965.

Construction was started on a federal building at Fort Simpson and plans were completed for the construction of a federal building at Hay River. The relocation of a number of Crown-owned buildings

at Hay River was completed. A five classroom and mining shop addition to the Sir John Franklin School was constructed at Yellowknife. Plans were completed for the construction of Medium Security Prisons at Yellowknife and Whitehorse.

Construction was completed on 54 miles of all weather highway from Hay River to Pine Point, N.W.T. A contract was awarded for the construction of a bridge at the Hay River crossing to be completed in 1965. A combined Highway and Powerline clearing contract approximately 95 miles in length from Pine Point to Buffalo River was substantially completed. A number of surveys were undertaken for a variety of projects for Government Departments including an extensive engineering study and drainage survey at Inuvik.

On April 1 the Department assumed responsibility for the maintenance and operation of the Northwest Highway System, consisting of 1,138 miles of the Alaska Highway, the Haines Road (117 miles), and a number of connecting access roads.

An extensive dredging program on the Athabaska, Slave, and Mackenzie river systems was carried out. A large extension to the public wharf at Hay River was constructed and improvements were made to wharf facilities at Fort Providence, Fort Simpson, Fort Chipewyan and various other locations on the Mackenzie River system. Extensive survey work was carried out at various locations from Hay River to the Mackenzie delta. A number of subsoil investigations were made by the Banff Soil Mechanics Section, particularly at Inuvik, Hay River, and Whitehorse.

Plans for 1965

Work will be started on the construction of housing and additions to schools at Pangnirtung and Pond Inlet.

Planning will be started for the construction of a number of schools at various settlements in Quebec such as Sugluk, Port Harrison, Povungnituk, and Great Whale River.

A Seismograph Vault will be constructed at Churchill for the Department of Mines and Technical Surveys. A start will be made on the installation of sewer and water systems at Eskimo Point and Baker Lake.

A new four classroom school and gymnasium, warehouse, six-apartment building, and two houses will be constructed at Fort McPherson.

Medium Security Prisons will be constructed at Yellowknife and Whitehorse for the territorial governments.

A twenty-unit apartment block will be constructed at Inuvik.

A school and housing will be constructed at Pine Point for the Department of Northern Affairs and National Resources and federal buildings will be constructed at Hay River, and Fort Nelson. Site investigations will be undertaken for the preparation of plans for large schools and hostels proposed for construction at Cambridge Bay, Rae, Yellowknife, Hay River, Inuvik, Great Whale River, and Fort Good Hope.

Nursing Stations will be constructed at Aklavik and Fort Franklin for the Department of National Health and Welfare.

A six-classroom and gymnasium addition to the school, and a six-unit apartment building for staff, will be constructed at Moosonee for the Department of Citizenship and Immigration.

The maintenance program will be continued on the Alaska Highway and Haines Road. Approximately fifty miles of gravel surfacing and sixty miles of new construction will be undertaken on the Fort Smith and Pine Point highways. A survey will be made for reconstructing the section of the highway between the old and new town sites of Hay River, and water and sewer facilities will be improved there. Grading will be started on the first 80 miles of the Ross River-Carmacks Highway. Site surveys will be made for a number of bridge crossings, and a bridge may be built over the Lappe River. Reconnaissance for the Carmacks-Snag road will be continued. The dredging plant will continue to be employed on maintenance dredging and improvement work on the Athabaska and Mackenzie river systems. Work will be started on a major channel improvement project on the Sans Sault Rapids. A new tug to be named "Sans Sault" will be delivered and placed in operation which will increase the efficiency and versatility of the dredging fleet.

A wharf and storage area is to be constructed at Tuktoyaktuk and the present wharf at Inuvik reconstructed. A new wharf will be constructed at Aklavik, Fitzgerald, and Fort Smith (BellRock).

ROYAL CANADIAN MOUNTED POLICE

Responsibilities The Royal Canadian Mounted Police remains the only law enforcement agency in the Yukon Territory and the Northwest Territories and is responsible for the enforcement of Federal Statutes, the Criminal Code, and Territorial Ordinances. In addition, the Force is responsible for policing the municipalities of Whitehorse, Dawson, Yellowknife, and Hay River, as well as small areas of Northern British Columbia and the northern portion of Wood Buffalo Park in Alberta. The Force also performs a number of varied functions on behalf of other Government Departments and agencies.

Long-term Plans

Since the increased concentration of population in the northern settlements is resulting in more time being spent policing the immediate settlement areas, aircraft are being used more frequently for patrolling the outlying areas. Nevertheless, dog and boat patrols continue to visit all distant settlements when practicable. Continuing increase in the field staff of other Government Departments is gradually relieving the Force of some of the extra duties previously performed.

The location and strength of detachments continue to alter from time to time in order to cope with economic and industrial developments, population shifts, changing patterns of crime, and flood and epidemic conditions.

Review of 1964 Operations

<u>MILEAGE</u>	<u>1963</u>	<u>1964</u>
Dog Team	41,054	35,461
Boat	98,875	92,924
Foot Patrols	32,230	40,846
Aircraft, railway, motor-vehicle...	1,437,700	1,568,683
TOTAL	1,609,859	1,737,914

<u>INVESTIGATIONS</u>	<u>1963</u>	<u>1964</u>
Offences Investigated.....	8, 311	8, 801
Other duties performed.....	44, 435	31, 816
Total Prosecutions.....	5, 895	5, 505
Prosecutions (Liquor).....	3, 928	3, 258
Murders Investigated.....	3	4
Narcotics Investigated.....	1	1
	<u>66, 501</u>	<u>52, 643</u>
 <u>PRISONERS HANDLED</u>		
Yukon Sub-Division	2, 065	1, 799
Fort Smith Sub-Division	1, 145	1, 498
Western Arctic Sub-Division.....	632	583
Central Arctic Sub-Division	25	24
Eastern Arctic Sub-Division	86	145
Total	<u>3, 953</u>	<u>4, 049</u>

In isolated areas members continue to render medical assistance. Everywhere assistance is given to the enforcement of the Dog Ordinance and to the inoculation of all dogs for rabies and in some instances distemper. Patrols are made to Eskimo and Indian camps to enquire into the health and welfare of the people, to look into game matters, and to record all information of interest to the Force and other Government Departments. Close touch is kept with all tourists travelling through the North to ensure safe arrival at their destinations. Highways are patrolled and watercraft checked to ensure compliance with safety regulations.

Members are engaged in the Scouting Movement, hockey and base-ball activities, youth work, and a number of special fields where emphasis is placed on the prevention of crime.

Five aircraft were engaged in duties in the Yukon Territory and Northwest Territories; these were posted at Whitehorse, Inuvik, Fort Smith, Frobisher Bay, and Fort Churchill.

The financial agreement for the policing of the Northwest Territories was signed. Although the proposed agreement was not signed for the policing of the Yukon Territory, the Force continued to operate in the spirit of this document.

A telex system is used for communications at Whitehorse and Fort Smith, and single sideband radio has been established to connect Inuvik, Whitehorse, Fort Smith, Fort Churchill, and Frobisher Bay as well as numerous detachments.

Central Arctic Sub-Division Headquarters was moved from Baker Lake, Northwest Territories, to Fort Churchill, Manitoba, and new detachments were opened at Pine Point and Igloolik, while Herschel Island Detachment was closed.

Plans for 1965

It is proposed to open a new detachment at Cape Dorset and re-open the detachment at Chesterfield Inlet, NWT.

For a good many years the need for new gaols in the North has been emphasized and it is now expected that tenders will be called this spring for the construction of new gaols at Whitehorse and Yellowknife. We are indeed fortunate to have operated our police cells, which were never designed or equipped to fill the capacity of Territorial Gaols, for so many years without any unfortunate incidents and it will be a relief to have adequate up-to-date gaol facilities.

Consideration is being given to the construction of additional detachment office space and accommodation for married and single personnel at Cape Dorset, Igloolik, Rae, Cambridge Bay, and Coppermine.

Close liaison with Federal Government Departments and the Territorial Governments will be maintained.

DEPARTMENT OF TRANSPORT (AIR)

CIVIL AVIATION BRANCH

Responsibilities Operation and management of departmental airports, and supervision of several airports operated by other agencies.

Long-term Plans

To anticipate as far as possible the future needs of civil aviation in the north.

Review of 1964 Operations

Resolute Airport

By Cabinet directive the Resolute Airport was transferred from the Department of National Defence to the Department of Transport. The RCAF had operated the Resolute Airport for many years to support the supply operation of the Joint Arctic Weather Stations at Alert, Eureka, Isachsen, and Mould Bay. Responsibility was assumed for the functions formerly performed by the RCAF on April 4, and Treasury Board approved the Department's recommendations to enter into a contract with Tower-Foundation Joint Ventures to operate and maintain the Airport under the jurisdiction of the Civil Aviation Branch Airport Manager. The RCAF phase-out was completed by May 31.

Churchill, Manitoba

Responsibility for the operation and maintenance of the airfield was taken over from the Department of National Defence.

Frobisher Airport

Progress was made in the consolidation of civil aviation services. A group of buildings known as "West Forty" on the west side of the airport was closed down. Steps were taken to consolidate common services between the Department of Transport and the Department of Northern Affairs and National Resources regarding building maintenance, vehicle maintenance, stores and other services such as water hauling, garbage collection and sewage disposal.

Fort Simpson

Two single dwellings were erected.

Norman Wells

Renovations to the electrical distribution system were carried out and a new utilidor system was installed.

Watson Lake

Four single dwellings were erected at the airport and improvements were made to the water and sewer system.

Whitehorse

Extensive reconstruction work on the runways, aircraft parking areas, taxiways, and terminal area was completed.

Yellowknife

A car parking area and entrance road was constructed to serve the new air terminal building. Work on the airfield included reconstruction of runways and drainage facilities.

General

Routine improvements were made to runways, accommodation, and navigation systems at Fort Chimo, Fort Smith, and Inuvik.

Plans for 1965

The need for civil aviation facilities in the North will continue to be evaluated, and improvements made to existing airfields, buildings and services as required.

The air terminal building at Fort Smith will be extended. Other plans call for the development of an airport at Pine Point and an aircraft parking apron at Cambridge Bay. Airport improvements at Hay River include the paving of the runway, taxiways, and apron. Major repairs to one runway at Yellowknife also are planned.

CONSTRUCTION BRANCH

Responsibilities Construction for the Air Services of the Department of Transport.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1964 Operations

The Construction Branch undertook and carried out:

- (a) Airport development and lighting projects:
 - (i) In the Northwest Territories: Frobisher, Norman Wells, and Yellowknife.
 - (ii) In the Yukon Territory: Watson Lake and Whitehorse.
 - (iii) In the Provinces: Fort Nelson, B.C. and Thompson, Man.
- (b) Buildings and other miscellaneous projects:
 - (i) In the Northwest Territories: Alert, Arctic Bay, Baker Lake, Banks Island, Cambridge Bay, Coral Harbour, Clyde River, Fort Resolution, Fort Good Hope, Fort Simpson, Fort Smith, Inuvik, Isachsen, Mould Bay, Norman Wells, and Yellowknife.
 - (ii) In the Yukon Territory: Burwash Landing, Dawson, Mayo, Teslin, and Watson Lake.
 - (iii) In the Provinces: Churchill, Man., Cape Hopes Advance, Que., Fort Chimo, Que., Fort Nelson, B.C., Fort St. John, B.C., McMurray, Alta., Port Harrison, Que., and Smith River, B.C.

Plans for 1965

The Construction Branch will complete or continue work in progress, or begin new work as follows:

- (a) Airport development and lighting:

- (i) In the Northwest Territories: Alert, Cambridge Bay, Forbisher, Hay River, Pine Point, Sachs Harbour, and Yellowknife.
- (ii) In the Yukon Territory: Whitehorse.
- (iii) In the Provinces: Fort Nelson, B.C.; Lynn Lake, Man.; McMurray, Alta.; Thompson, Man.; and Fort St. John, B.C.

(b) Buildings and other miscellaneous projects:

- (i) In the Northwest Territories: Alert, Arctic Bay, Baker Lake, Coral Harbour, Chesterfield Inlet, Clyde River, Coppermine, Ennadai Lake, Eureka, Fort Chipewyan, Fort Good Hope, Fort Simpson, Fort Smith, Fort Resolution, Frobisher, Grise Fiord, Hay River, Mould Bay, Norman Wells, Nottingham Island, Port Radium, Resolute Bay, Resolution Island, Sachs Harbour, and Yellowknife.
- (ii) In the Yukon Territory: Burwash Landing, Watson Lake, and Whitehorse.
- (iii) In the Provinces: Cape Hopes Advance, Que.; Churchill, Man.; Cree Lake, Sask.; Fort Chimo, Que.; Fort Nelson, B.C., Fort St. John, B.C., La Ronge, Sask., Lynn Lake, Man., McMurray, Alta., Nitchequon, Que., and Port Harrison, Que.

METEOROLOGICAL BRANCH

Responsibilities Provision of adequate meteorological facilities and services to meet requirements; research necessary to support these services and to increase understanding of the weather and climate of northern Canada, both near the surface and in the upper air observing stations, obtaining of meteorological reports from ships in northern waters, ice reconnaissance, the provision of weather forecasting and weather advisory service, and ice forecasting and ice advisory service for the navigable waters of the north. Operation of thirteen upper air stations in the north and, jointly with the United States Weather Bureau, operation of the arctic meteorological observatories at Resolute, Alert, Eureka, Isachsen, and Mould Bay, including maintenance and development of the supporting airstrips at the last four of these stations, and operation of telecommunications facilities at these four stations in support of the meteorological program.

Long-term Plans

To provide more complete meteorological and related scientific information in the north, necessitating an expanded network of surface weather observing stations and improved equipment for upper air observations to higher levels; to provide forecasting services as needed for expanding activities in the north; to provide more married living accommodations at several locations in order to encourage more experienced personnel to serve at these stations; to operate seismic vaults for the Department of Mines and Technical Surveys at a few locations, and to undertake a program of ozone, water vapour, and radiation observations to high levels in the atmosphere at certain stations.

Review of 1964 Operations

North of 60°N latitude the surface observing network engaged in synoptic and aviation type weather reporting remained constant at 56 stations, including 16 DEW Line sites, at four of which a staff of meteorological technicians was maintained.

In addition to the regular weather observing programs, selected stations in the surface network participated in sampling for radio-active fall-out, and observation of visual aurora and noctilucent clouds. The aurora and noctilucent cloud observations are an International Quiet Sun Year Project. The snow density surveying program is also being extended and 15 snow surveying stations will be established by the spring of 1965. Meteorological inspections to maintain the quality and standard of weather observations were completed for 90 per cent of the surface observing network.

All the upper air stations maintained their full program of two rawinsonde ascents per day, sending instruments aloft to heights averaging over 80,000 ft. to measure and transmit temperature, pressure, and relative humidity data throughout the ascents. These instruments were also tracked in the course of their ascent to determine the upper winds at the various levels. Progress continued in achieving higher levels in upper air and upper wind observations. Fiberglass radomes to house new electronic ground equipment have now been installed at most of the stations. This equipment requires a good natural horizon free from obstructions down to at least 4 elevation. Several stations do not meet these requirements and at Inuvik, Coppermine, Clyde, Fort Chimo, and Frobisher the upper air observing stations may have to be moved to achieve satisfactory operation. At Coppermine and Frobisher a program of seismological observations was carried out for the Department of Mines and Technical Surveys.

The Arctic Forecast Team, a component of the Weather Office in Edmonton, continued to provide routine and special forecasts for various activities in the Arctic. Similar services were provided by weather offices at Whitehorse, Goose Bay, Frobisher, and Winnipeg for the Yukon, Baffin Island, and the southern part of the Northwest Territories. An innovation was the twice-daily issue of weather forecasts for central and western arctic coastal waters, broadcast on schedule by DOT Marine Radio Stations in the Arctic.

The High Level Forecast Centre in Montreal issued on a routine basis, forecasts for high-altitude aviation, covering areas from the Canada-US border to the North Pole. These forecasts were distributed throughout Canada and internationally by facsimile.

The Ice forecast Central, located in Halifax, issued seasonal ice out-looks, thirty-day ice forecasts, and five-day ice forecasts for arctic waters. A Field Ice Forecast Office was operated at Frobisher from mid-July to early October, and provided short-

range ice forecasts and advisories for the Hudson Bay route, Foxe Basin, and the Eastern Arctic. Similarly, a Field Ice Forecast Office was operated at either Cambridge Bay or Resolute, from mid-July until late September, to provide short-range ice forecasts and advisories for coastal waters of the Central and Western Arctic.

Qualified ice observers carried out a total of 3,190 flying hours of aerial ice reconnaissance, of which 1,895 flying hours were in arctic or sub-arctic areas. Shipboard ice observers were assigned to "Canadian Coast Guard Ships" for a total of 1,020 days, of which 590 days were on operations associated with arctic and sub-arctic.

In late April, May, and mid-June, three series of "Long Range Arctic Round Robin Flights" were carried out over arctic and sub-arctic waters. These flights provided 126 flying hours of reconnaissance in a chartered DC-4 aircraft. Three DC-3 and C-46 aircraft were chartered to provide medium range and tactical support for marine operations from Resolute (July 15 - September 25), Cambridge Bay / Cape Parry (June 20 - October 10), Churchill (June 25 - November 10), and Frobisher Bay (June 25 - November 10). Approximately 1,400 flying hours were completed. The aircraft were equipped with airborne radar and one carried doppler navigation equipment for use in Hudson Bay, Davis Strait, and Foxe Basin. This program was supplemented with 450 additional flying hours of ice reconnaissance on routine R.C.A.F. missions, and special projects and training flights. Shipboard ice observers made 172 short range helicopter flights totalling 95 flying hours from C.C.G.S. icebreakers in the Eastern and Western Arctic.

A small operation, totalling 50 flying hours was sompleted during the spring in the southern Mackenzie River system in support of shipping there.

Thirty-seven sites participated in a daily shore station reporting network as required, and twenty-three ice thickness stations provided weekly ice thickness observations from freeze-up to break-up.

At the Joint Arctic Weather Stations the meteorological program consisted of regular surface synoptic observations 8 times per day and two upper air (rawinsonde) and two pilot balloon observations daily. Systematic observations were made of sea ice thickness, snow surface and profile, and wind chill. Other observations included hourly surface weather, soil temperature, ozone, rates of evaporation, and fall-out at Resolute, auroral at Alert, Resolute, and Mould Bay,

profile of sea ice temperatures at Mould Bay, precipitation samples at Alert and solar radiation at Alert, Eureka, Isachsen, and Resolute.

The airstrip at Alert was kept open throughout the year. The remaining airstrips have been developed sufficiently for use during the major part of the summer, except during periods of excessive thaw or rainfall, by light aircraft and occasional heavy aircraft, as well as for major air resupplies during the spring and fall when the soil is frozen. With the accumulation of fill, the airstrips at Eureka and Isachsen and to a lesser extent that at Mould Bay tend to blow clear of snow, and may be opened during the winter months should necessity arise. Those at Alert, Eureka, and Mould Bay are now 200 ft. wide and over 5,000 ft. long, and progress is being made toward these dimensions at Isachsen. All the Joint Weather Stations are now equipped to handle and store fuel oil in bulk, and full use was made of these facilities at Alert, Isachsen, and Mould Bay during the spring resupply, at Alert during July, and at Eureka during the summer sea supply. Improved upper air equipment was in use throughout the year at all these stations. Improvements were made to the fresh water storage and sanitary facilities at Isachsen, to the air/ground/air radar communications at Alert, and in the low frequency and single side band radio communications facilities at Alert, Eureka, Isachsen.

The automatic weather station, installed at Sherwood Head in 1961, was serviced and re-activated in August. Subsequently the instrumentation failed progressively and by the end of the year the station was transmitting barometric pressure only, and on one radio frequency only.

Plans for 1965

New electronic ground equipment (GMD radiotheodolites) will be delivered to Hall Beach, Whitehorse, Norman Wells, Baker Lake, Sachs Harbour, Coral Harbour, and Clyde for installation during the summer. At such locations as Fort Chimo, Frobisher, Coppermine, and Inuvik steps will be taken towards relocating the stations if the obstructions cannot be removed. The high cost of relocation necessitates scheduling this over several years.

Progress will be made in equipping ice reconnaissance aircraft with more sophisticated observer and navigation aids (e.g. airborne radars, doppler and compass systems, and infra-red) to obtain better accuracy and detail.

Weather and ice forecast and advisory services will be provided as in 1964 with some increase in volume of services resulting from the establishment of an Arctic Flight Information Region. The value of weather satellite picture relay in the display of ice conditions in arctic areas will be examined and evaluated.

Development and extension of the airstrip at Isachsen to the dimensions 200 ft. x 5,000 ft. will be continued. Fill will be added at Mould Bay to minimize the problems of snow drifting and snow removal. Drainage will be improved at all airstrips. The upper air installation at Mould Bay will be relocated to avoid obstacles which limit the effectiveness of the upper air equipment at its present site. New electrolytic hydrogen generators will be installed at all these sites.

TELECOMMUNICATIONS AND ELECTRONICS BRANCH

Responsibilities To provide radio aids to air and marine navigation; to provide radio facilities for various scientific organizations and for meteorological observations; to provide other telecommunication facilities as required; to foster and promote the development of public telecommunication services; to control and manage the use of the frequency spectrum; to licence stations and enforce the regulations under the Radio Act.

Long-term Plans

To expand on operations as the need arises.

Review of 1964 Operations

Baker Lake

Additional air-ground VHF communications facilities were provided.

Coral Harbour

A new high-power radiobeacon was installed to replace obsolete equipment. Voice facilities and weather broadcasts were transferred from the low-power beacon to the new high-power equipment thus providing better service to pilots.

Dawson

Four new dwelling units were constructed to replace old buildings acquired from the RCCS.

Fort Resolution

Additional air-ground communications frequencies on VHF were commissioned.

Fort Smith - Fort Simpson

A new air-operational landline teletype circuit was commissioned between Fort Smith and Fort Simpson.

Frobisher

Improvements were made to radioteletype circuitry between Frobisher and Coral Harbour by the installation of electronic error correction equipment. The communications operating position was relocated to the Federal Building and the remote HF receiver site completed. Buildings and services were provided for a permanent Instrument Landing System with equipment installation to be completed in 1965.

Isachsen

A complete refit of the communications control console and modernization of radio facilities was carried out.

Resolute

Responsibility was assumed for communications facilities formerly operated by the RCAF including VHF and UHF air-ground facilities and a radioteletype circuit to Churchill. Improvements to antenna systems were completed and single sideband communications to the Joint Arctic Weather Stations at Alert, Eureka, and Isachsen, were inaugurated on 5599 Kc/s and 7561.5 Kc/s.

Whitehorse

Equipment to provide an Instrument Landing System was installed and will be commissioned early in 1965.

Yellowknife

The radio range, which had been destroyed by fire, was rebuilt. The aeradio station was relocated to the new air terminal building.

General

Unattended marine radiobeacons of the transponder type were established at Coats Island (Cary's Swan Nest Point), Mansel Island (Cape Acadia), and Button Islands (Goodwin Island) to provide navigational assistance to vessels.

Communications facilities in support of the Air Traffic Control Upper Information Region, established in October, included procurement of a teletype circuit in a military communications system to handle air traffic control messages between Resolute and Goose,

and provision of air-ground VHF facilities at Resolute and Alert.

Departmental communication cable plant at Fort Smith, Yellowknife, and Hay River was sold to Canadian National Telecommunications, and telephone plant at Resolute to the Bell Telephone Company.

There were over 300 radio stations licensed to Government Departments and agencies in Northern Canada, of which about 25 were established during 1964. There were over 200 stations licensed to private companies, of which 22 were established during 1964.

Development of Public Telecommunications Services

Construction of the CNT communications system along the Mackenzie Valley from Fort Providence to Inuvik continued; the target date for completion is now the spring of 1966. Long distance telephone service was provided to Fort Simpson in March and should be extended to Wrigley, Fort Norman, Norman Wells, and Fort Good Hope by spring 1965 and Fort McPherson and Aklavik by spring of 1966.

The CNT system between Hay River and Lady Franklin Point was placed in operation January 1 for private line services, and long distance telephone service was extended to the CNT exchange at Cambridge Bay in December.

CNT opened local telephone exchanges at Pine Point, Fort Smith, Aklavik, Fort McPherson, Port Radium, and Arctic Red River, and expanded the capacity of the exchanges at Fort Simpson and Yellowknife. The capacity of the exchanges at Hay River and Fort Smith is to be expanded in 1965, and an exchange is planned for Coppermine in 1966.

CNT base stations at Whitehorse, Haines Junction, Destruction Bay, Koidern, and Dawson provided service for fixed and mobile radio stations operated by oil and mining exploration parties, construction companies, missionaries, highway maintenance, etc. These facilities can service the Peel Plateau, the Mackenzie Delta, and areas south of Inuvik.

The Bell Telephone Company began operation of the telephone system at Resolute and extended long distance service there from Frobisher in May.

The Bell Telephone Company opened exchanges at Cape Dorset and Pangnirtung in August and Igloolik in September 1964, with circuits back to Frobisher for long distance service.

Plans for 1965

Burwash Landing

The construction of an aeradio station consisting of an operations building, radio range, transmitter site, power house and staff accommodation will begin in 1965 with a target for completion in 1966.

Chesterfield Inlet

An additional dwelling unit will be built.

Fort Good Hope

The rehabilitation of the non-directional radiobeacon and transmitter site and the provision of cold storage facilities and additional fuel tanks will be undertaken.

Nottingham Island

General building rehabilitation will be carried out.

Sachs Harbour

Single sideband equipment for communications with Resolute will be installed in the fall.

General

Non-directional aeronautical radiobeacons will be installed at Arctic Bay, Pangnirtung, Payne Bay, Grise Fiord, and Pond Inlet at the request of the Department of Northern Affairs and National Resources.

The air-operational teletype network will be extended to Wrigley and Norman Wells when CNT landline facilities to these points are completed in the spring of 1965.

Public Telecommunications Services

The CNT long distance telephone service will be extended to Wrigley, Fort Norman, Norman Wells and Fort Good Hope. The capacity of the exchanges at Hay River and Fort Smith will be expanded. Additional base stations will be built at Swift River, Carmacks, Mayo, Calumet and Teslin. The Bell Telephone Company will open exchanges with long distance service at Pond Inlet and Arctic Bay.

DEPARTMENT OF TRANSPORT (MARINE)

MARINE OPERATIONS BRANCH

Responsibilities Providing transportation facilities and co-ordination of cargo and passenger requirements for government agencies; providing aids to navigation in Hudson Bay, Hudson Strait, and Goose Bay; rendering icebreaker assistance wherever and whenever required; providing and arranging for stevedoring facilities at the Port of Goose Bay, Labrador, where over 19, 230 net tons of cargo were handled.

Long-term Plans

Continuing to improve marine work in the north; planning to meet anticipated additional resupply requirements.

Review of 1964 Operations

The following vessels were engaged in northern transportation:

CANADIAN COAST GUARD SHIPS

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
CCGS "Auk"	Goose Bay - Baffin Sites	648, 000
	Ekalgad - Cape Dyer	137, 600
	Kivitoo - Cape Dyer	203, 400
	Churchill - Whale Cove	1, 097, 541
	Churchill - Eskimo Point	1, 108, 551
	Whale Cove - Baker Lake	52, 769
	Dartmouth - Sugluk	40, 000
	Rankin Inlet - Baker Lake	3, 000
	Churchill - Rankin Inlet	1, 085, 004
	Churchill - Baker Lake	752, 556
	Churchill - Whale Cove	15, 000
	Churchill - Chesterfield Inlet	4, 000
	Churchill - Rankin Inlet	988
	Churchill - Baker Lake	1, 157, 013
	Rankin Inlet - Churchill	10, 360
	Baker Lake - Churchill	6, 363
	Whale Cove - Churchill	38, 910
	Chesterfield Inlet - Dartmouth	20, 750
		<u>6, 381, 805</u>

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
CCGS "Camsell"	Herschel Island - Victoria	41, 750
	Herschel Island - Coppermine	4, 200
		<u>45, 950</u>
CCGS " C. D. Howe"	Montreal - Inugsuin Fiord	62, 979
	Montreal - Wakeham Bay	35, 868
	Montreal - Clyde River	6, 237
	Montreal - Nottingham Island	4, 445
	Montreal - Cape Hope Advance	3, 482
	Montreal - Cape Dorset	10, 536
	Montreal - Grise Fiord	434, 243
	Montreal - Pond Inlet	231, 941
	Montreal - Broughton Island	995
	Montreal - Arctic Bay	3, 400
	Montreal - Eastern Arctic Patrol	124, 300
	Frobisher Bay - Quebec	800
	Clyde River - Quebec	54, 162
	Payne Bay - Quebec	21, 023
	Port Burwell - Quebec	16, 300
	Broughton Island - Quebec	63, 150
	Pond Inlet - Quebec	50, 328
	Arctic Bay - Quebec	47, 503
	Grise Fiord - Quebec	39, 575
	George River - Quebec	12, 325
	Pangnirtung - Quebec	100
	Pond Inlet - Grise Fiord	1, 000
	Montreal - Koartak	1, 399
	Grise Fiord - Cape Christian	600
	Sugluk - Wakeham Bay	22, 400
	Quebec - Resolute Bay	10, 872
	Resolute Bay - Padloping	1, 040
	Arctic Bay - Pangnirtung	3, 506
	Cape Dorset - Pond Inlet	150
	Arctic Bay - Pond Inlet	13, 647
		<u>1, 278, 306</u>
CCGS "Gannet"	Montreal - Hall Lake	117, 228
	Montreal - Rowley Island	11, 690
	Montreal - Longstaff	12, 938
	Montreal - Cape Hooper	14, 514
	Montreal - Brevoort Island	43, 652

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
CCGS "Gannet"	Montreal - Cape Dyer	123, 027
	Montreal - Broughton Island	13, 568
	Montreal - Cape Christian	20, 465
	Montreal - Fort Chimo	17, 790
	Marine Operations	40, 000
	Master	8, 118
	Goose Bay - Saglek	49, 744
	Goose Bay - Cartwright	23, 581
	Goose Bay - Hopedale	56, 816
	Northern Ports -	41, 620
	Goose Bay -Resolution Island	69, 517
	Hopedale - Halifax	96, 325
	Saglek - Goose Bay	11, 620
	Saglek - Hopedale	750
	Durban Island - Saglek	14, 800
	Kivitoo - Longstaff	40, 500
	Montreal - Cape Christian	20, 400
		<u>848, 663</u>
CCGS " Narwhal"	Halifax - Cape Christian	3, 471
CCGS " Montcalm"	Churchill - Repulse Bay	346, 238
	Churchill - Hall Lake	13, 011
	Churchill - Pelly Bay	35, 012
	Quebec - Frobisher Bay	15, 317
	Frobisher Bay - Cape Dyer	35, 600
	Montreal - Ivugivik	306
	Montreal - Koartak	211
	Ships' Stores	10, 075
	Montreal - Port Burwell	301, 942
	Montreal - Frobisher Bay	12, 972
	Montreal - Ivugivik	416, 608
	Frobisher Bay - Brevoort	7, 600
	Frobisher Bay - Broughton	
	Island	17, 200
	Quebec - Port Burwell	27, 548
	Frobisher Bay - Rankin Inlet	1, 734
	Frobisher Bay - Montreal	54, 975
		<u>1, 296, 349</u>

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
CCGS " d'Iberville"	Ship Stores	2, 195
	Montreal - Pangnirtung	446
	Montreal - Tangquary Fiord	57, 883
	Montreal - Ice Pack VI	492
	Montreal - Isachsen	10, 453
	Montreal - Sherwood Head	1, 832
	Montreal - Resolute Bay	2, 936
	Montreal - Eureka	829, 075
	Montreal - Alert Bay	
	via Resolute	13, 300
	Montreal - Mould Bay	14, 263
	Montreal - Pangnirtung	446
	Mary River - Quebec	7, 000
	Eureka - Quebec	3, 400
	Quebec - Quebec	345
	Cape Hope Advance - Montreal	4, 000
	Eureka - Resolute Bay	38, 500
	Eureka - Tanquary Fiord	15, 506
	Ex "Canuk Trader", Resolute	
	Bay- Eureka	109, 000
	Thule - Eureka	32, 794
	Sherwood Head - Quebec	306
	Eureka - Quebec	107, 510
		<u>1, 251, 736</u>
CCGS "N. B. McLean"	Montreal - Lake Harbour	229, 324
	Montreal - Chesterfield	
	Inlet	88, 556
	Montreal - Pond Inlet	39, 441
	Montreal - Resolute Bay	71, 148
	Montreal - Churchill	8, 084
	Ivugivik - Montreal	14, 305
	Cape Dorset - Montreal	43, 115
	Churchill - Chesterfield	
	Inlet	14, 321
	Churchill - Coral Harbour	53, 584
	Churchill - Cape Dorset	166, 733
	Churchill - Wakeham Bay	500
	Churchill - Sugluk	500
	Churchill - Koartak	500

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
CCGS " N. B. McLean"	Churchill - Ivugivik	500
	Churchill - Lake Harbour	1, 117
	Churchill - Nottingham Island	19, 113
	Churchill - Cape Hopes Advance	2, 473
	Churchill - Resolution Island	1, 620
	Pond Inlet - Grise Fiord	30
	Via "C. D. Howe" - Churchill - Grise Fiord	2, 176
	Churchill - Pond Inlet	2, 851
		<hr/> 759, 991
CCGS " John A. Macdonald"	Montreal - Pond Inlet	39, 700
	Montreal - Resolute Bay	58, 515
	Montreal - Pangnirtung	129, 055
	Montreal - Port Burwell	14, 000
	Montreal - Arctic Bay	512, 785
	Montreal - Ice Pack VI	2, 020
	Montreal - Koartak	117, 561
	Montreal - Strathcona Sound	38, 659
	Halifax - Pangnirtung	24, 000
	Bonne Bay - Pond Inlet	40, 000
	Via "d'Iberville" - Thule - Eureka	32, 794
	Thule - Isachsen via Resolute Bay	36, 647
	Thule - Mould Bay	29, 626
		<hr/> 1, 076, 362
CCGS " Labrador"	Ships' Fuel - Pond Inlet	327, 040
	Halifax - Cape Hopes Advance	193, 652
	Halifax - Frobisher Bay	10, 000
		<hr/> 530, 692
CCGS " Wolfe"	Halifax - Resolution Island	5, 425
	Nottingham Island - Montreal via Churchill.	600
	Halifax - Nottingham Island	331, 738
	Halifax - Hopedale	95, 607
	Halifax - Battle Harbour	20, 250
	Halifax - Cartwright	6, 290
	Churchill - Nottingham Island	25
	Churchill - Sugluk	360
	Churchill - Lake Harbour	21, 830
	Churchill - Cape Hopes Advance	90, 074

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
CCGS "Wolfe"	Cape Hopes Advance - Montreal (via Churchill).	1, 720
	Nottingham Island - Montreal (via Churchill).	80
	Churchill - Coral Harbour	4, 510
	Churchill - Cape Dorset	2, 523
	Charlottetown - Hall Lake	40, 000
	Hall Lake - Longstaff	206, 500
	Longstaff - Hall Lake	128, 000
		<hr/> 955, 532
CCGS "Marmot"	Frobisher Bay - Quebec	40, 000
CCGS "Skua"	Goose Bay - Saglek	141, 593
	Goose Bay - Hopedale	46, 951
	Goose Bay - St. Anthony	95, 888
	Goose Bay - Cartwright	296, 562
	Pangnirtung - Quebec	12, 180
	Montreal - Goose Bay	123, 315
	Goose Bay - "Jos Simard" (Tanker)	646, 506
	Montreal - St. Anthony	425
	Montreal - Goose Bay	121, 875
	Churchill - Hall Beach	1, 309
	Churchill - Igloolik	1, 020, 020
	Churchill - Pelly Bay (via Hall Beach)	4, 891
	Hall Beach - Longstaff Bluff	1, 183, 368
	Hall Beach - Rowley Island	1, 177, 384
	Montreal - Resolution Island	112, 543
	Montreal - Cartwright	36, 332
	Ex M. V. "Jos Simard" - Chester- field Inlet	840, 000
	Ex M. V. "Jos Simard" - Coral	801, 436
	Ex M. V. "Jos Simard" - Pangnirtung	1, 512, 000
	Ex M. V. "Jos Simard" - Cape Dorset	2, 226, 000
	Ex M. V. "Jos Simard" - Sugluk	1, 075, 200
	Ex M. V. "Jos Simard" - Pond Inlet	1, 172, 396
		<hr/> 12, 648, 174

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
CCGS "Mink"	Montreal - Belcher Islands	225, 015
CCGS "Eider"	Montreal- Battle Harbour/ Cartwright	732, 794
	Churchill - Montreal	32, 760
	Churchill - Rankin Inlet	
	Voy. 4	992, 045
	Churchill - Whale Cove	
	Voy. 4	45, 815
	Churchill - Chesterfield Inlet	
	Voy. 5	48, 873
	Churchill - Igloolik	
	Voy. 5	992, 480
	Quebec - Montreal	50, 000
	Montreal - Gap Pine Sites	174, 236
	Montreal - Davis Inlet	3, 022
	Montreal - North West River	655
	Churchill - Coral Harbour	
	Voy. 3	1, 056, 563
	Churchill - Rankin Inlet	
	Voy. 2	1, 098, 250
	Churchill - Fort Chimo	
	Voy. 6	11, 802
	Churchill - Montreal	
	Voy. 6	25, 662
	Rimouski - Nottingham Island	9, 000
	Churchill - Rankin Inlet	1, 000, 708
	Ex M. V. "White Rose"	
	Fort Chimo	2, 250, 000
		8, 524, 665
CCGS "Puffin"	Montreal - Hudson Bay	74, 330
	Quebec - Great Whale River	40, 000
	Montreal - Winisk	485, 374
	Montreal - Quebec	30, 000
	Winisk - Montreal	84, 948
	Great Whale River - Montreal	39, 298
	Great Whale River - Montreal	1, 575
	Bear Island - Montreal	77, 000
	Winisk - Great Whale River	36, 100
	Churchill - Great Whale River	704, 425
	Churchill - Winisk	43, 680
	Churchill - Winisk	721, 325

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
CCGS "Puffin"	Great Whale River - Winisk	274, 666
	Cape Jones - Great Whale River	4, 300
	Bear Island - Great Whale River	56, 600
	Bear Island - Montreal	77, 000
		<hr/> 2, 750, 621
CCGS "Raven"	Churchill - Great Whale River	3, 000
	Churchill - Fort George	845, 880
	Sept Iles - Pointe Amour	13, 985
	Montreal - Great Whale River	493, 965
	Montreal - Belcher Island via Great Whale River	9, 760
		<hr/> 1, 366, 590
TOTAL CCG SHIPS:		39, 983, 922
		<u>OR</u> 19, 991.6 s/tons

CHARTER AND COMMERCIAL VESSELS

M. V. "Cacouna"	Montreal - Povungnetuk	4, 479
	Montreal - Coral Harbour	84, 979
	Montreal - Rankin Inlet	365, 744
	Montreal - Port Harrison	12, 277
	Montreal - Baker Lake	751, 482
	Churchill - Montreal	4, 800
	Eskimo Point - Montreal	3, 640
	Whale Cove - Montreal	1, 750
	Eskimo Point - Churchill	2, 900
	Port Harrison - Montreal	141, 190
	Montreal to Chesterfield Inlet	44, 860
	Montreal to Eskimo Point	211, 100
	Montreal to Whale Cove	176, 954
	Montreal to Port Burwell	95, 709
	Quebec to Chesterfield Inlet	975
	Rankin Inlet to Montreal	4, 130
	Povungnetuk to Montreal	89, 880
	Baker Lake - Montreal	86, 090
		<hr/> 2, 082, 939

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
S.S. "C.A. Crosbie"	Montreal - Pond Inlet	119, 999
	Montreal - Clyde River	14, 277
	Montreal - Frobisher Bay	1, 738, 000
	Forbisher Bay - Montreal	435, 000
		<hr/> 2, 307, 276
M.V. "Charny"	Great Whale River - Montreal	174, 158
	Winisk - Montreal	77, 725
	Montreal - Winisk	595, 751
	Montreal - Great Whale River	858, 888
		<hr/> 1, 706, 522
S.S. "Federal Pioneer"	Montreal to Dew Line Sites	4, 277, 737
	Hall Beach to Quebec	50, 000
	Hall Beach - Montreal	528, 600
	Kivitoo etc. - Montreal	625, 670
	Kivitoo - Montreal	134, 476
	Clyde River - Montreal	10, 480
	Padloping - Montreal	40, 880
	Montreal - Pelly Bay	20, 664
	Montreal - Cape Christian	60, 444
	Montreal - Hall Beach	422, 892
	Montreal - Clyde River	605, 492
	Montreal - Igloolik	391, 767
	Montreal - Broughton Island	575, 835
	Montreal - Longstaff Bluff	30, 808
	Montreal - Padloping	181, 242
	Montreal - Baffin Fox	225, 085
		<hr/> 8, 182, 072
M.V. "Glencoe"	Montreal - Great Whale River	189, 405
	Montreal - Povungnetuk	54, 099
	Montreal - Port Harrison	182, 661
	Port Harrison - Montreal	320
		<hr/> 426, 485
M.V. "J. Edouard Simard"	Montreal - Pond Inlet	1, 249, 920
	Montreal - Resolute Bay	9, 879, 094
	Montreal - Churchill	168, 000
	Montreal - Churchill	1, 004, 396
	Churchill - Winisk	7, 464, 384
	Churchill - Great Whale River	7, 388, 205

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
M.V. "J. Edouard Simard"	Churchill - Winisk	1, 784
		<hr/> 27, 155, 783
M.V. "Keta"	George River - Montreal	7, 430
	Montreal - George River	789, 643
	Montreal - Payne Bay	729, 147
	Payne Bay - Montreal	72, 295
		<hr/> 1, 598, 515
M.V. "Maridan C "	Fort Chimo - Montreal	199, 205
	Povungnetuk - Montreal	14, 370
	Montreal - Fort Chimo	1, 059, 473
	Montreal - Koartak	11, 198
	Montreal - Cape Hopes Advance	1, 430
	Montreal - Wakeham Bay	2, 112
		<hr/> 1, 287, 788
M.V. "Quebec Trader"	Povungnetuk - Port Harrison	14, 150
	Churchill - Montreal	24, 900
	Coral Harbour - Churchill	2, 579
	Montreal - Povungnetuk	670, 442
	Montreal - Port Harrison	1, 585, 647
	Montreal - Coral Harbour	324, 928
		<hr/> 2, 622, 646
M.V. "Sir John Crosbie"	Montreal - Frobisher Bay	1, 737, 209
	Frobisher Bay - Montreal	458, 180
	Montreal - Alert Bay via Thule	1, 091, 980
	Montreal - Gap Pine Sites	714, 550
	Goose Bay - Montreal	102, 411
		<hr/> 4, 104, 330
M.V. "Sea Transport"	Goose Bay- Gap Pine Sites	22, 020, 240
S.S. "Canuk Trader"	Resolute Bay - Montreal	1, 740, 300
	Montreal - Hopedale	86, 033
	Montreal - Resolute Bay	3, 509, 772
	Frobisher Bay - Montreal	1, 790, 000
	Montreal - Frobisher Bay	422, 000
	Montreal - Chesterfield Inlet via Resolute Bay	950
	Montreal - Eureka via Resolute	80, 893
	Montreal - Isachsen via Resolute	106, 623
	Montreal - Alert Bay via Resolute	30, 791

<u>Vessel</u>	<u>Voyage</u>	<u>Cargo in lbs.</u>
S.S. "Canuk Trader"	Montreal - Mould Bay	2, 177, 716
	Frobisher Bay - Goose Bay	210, 500
	Sorel - Resolute Bay	637
	Sorel - Mould Bay via Resolute	28, 500
	Sorel - Eureka via Resolute Bay	181
		<hr/> 10, 184, 896
M.V. "Jos. Simard"	Montreal - Baffin (avgas)	1, 433, 252
	Churchill - Chesterfield Inlet	840, 000
	Churchill - Coral Harbour	801, 436
	Churchill - Pangnirtung	1, 512, 293
	Churchill - Cape Dorset	2, 226, 000
	Churchill - Sugluk	1, 076, 200
	Churchill - Pond Inlet	1, 172, 396
	Goose Bay - Baffin	13, 224, 000
	Goose Bay - Hall Lake	10, 358, 000
		<hr/> 32, 643, 577
M.V. "Willowbranch"	Goose Bay - Hall Lake	2, 842, 000
	Montreal - Hall Lake	3, 366, 000
		<hr/> 6, 208, 000
M.V. "Polaris Explorer"	Montreal - Sugluk	168, 523
	Montreal - Koartak	89, 761
	Montreal - Cape Dorset	119, 895
		<hr/> 378, 179
M.V. "Swivel"	Montreal - Frobisher Bay	35, 974
M.V. "Ste. Foy"	Sugluk - Montreal	99, 600
	Cape Dorset - Montreal	73, 220
	Montreal - Cape Dorset	176, 739
	Montreal - Sugluk	167, 453
	Montreal - Wakeham Bay	421, 518
	Wakeham Bay - Montreal	45, 205
		<hr/> 983, 735
M.V. "Esso Brooklyn"	Montreal - Frobisher Bay	23, 580, 000
M.V. "White Rose:	Montreal - Frobisher Bay	4, 752, 000
	TOTAL CHARTER & COMMERCIAL SHIPS:	152, 260, 968
	<u>OR</u>	76, 130.5 s/tons

TONNAGE 1964 - WESTERN ARCTIC

Arctic Shipping Limited and Yellowknife Transportation Company	3, 567, 000
Northern Transportation Limited	3, 567, 000
Cargo handled at Goose Bay during 1964 season.	38, 461, 600

RECAPITULATION

Canadian Coast Guard Ships	19, 991.6 s/tons
Chartered & Commercial Vessels	76, 130.5 s/tons
Western Arctic	3, 567.0 s/tons
Goose Bay (cargo handling only)	<u>19, 230.8 s/tons</u>
Total all cargo:	118, 919.9 s/tons
Less: Frobisher Bay Bulk Oil	<u>14, 166.0</u>
NET TOTAL:	104, 753.9 s/tons

A cargo was again delivered to Thule, Greenland for the Canadian Army, Department of Transport, and other agencies. The Weather Stations at Resolute Bay, Mould Bay and Isachsen were serviced by convoy to Resolute Bay and by C.C.G.S "d'Iberville" to Sherwood Head and Eureka. Direction finding stations were calibrated. C.C.G.S. "Labrador" assisted in the oceanographic survey of Smith Sound, Baffin Bay, and Davis Strait. Commercial shipping to Churchill was assisted by icebreakers. Lighthouse and navigational aids were examined and serviced in Hudson Bay and Strait. In addition, C.C.G.S. "John A. Macdonald" carried out probes in Barrow Strait and Viscount Melville Sound on completion of resupply duties.

Included in the total tonnage is the shipment of bulk oil delivered to Frobisher Bay, in which operation assistance was rendered by the Department of Transport barge personnel.

Plans for 1965

Continued resupply together with scientific work as required by various government departments and stevedoring operations at Goose Bay, Labrador.

MARINE WORKS BRANCH

Responsibilities Establishment and maintenance of marine aids to navigation in the Athabasca-Mackenzie water route and in the Western Arctic, Hudson Strait, Hudson Bay, and Frobisher Bay areas.

Long-term Plans

Maintenance, operation, and expansion of marine aids to keep pace with expanding shipping requirements. Participation in the Inter-departmental Engineering Committee co-ordinating activities of government departments in relation to the Athabasca-Mackenzie water route.

Review of 1964 Operations

In the Athabasca-Mackenzie waterway aids to navigation were placed at the opening of the season, and regular frequent patrols were made to ensure that they were functioning as intended.

The number of aids of all types in use in the area increased by 298 to a total of 1310. Four sets of ranges were equipped with lights.

In the Hudson Bay area a new navigation light on an aluminum tower was established at Cape Pembroke on the north-eastern end of Coats Island. A navigation light on an aluminum tower was also established on Walrus Island in Fisher Strait. All existing lights and radio beacons were maintained in operation in the Hudson Strait area. A special working party from both Marine and Air Services installed responder marine radio beacons at Cape Acadia on the southern end of Coats Island and on Goodwin Island in the Button Island Group on the southern side of the entrance to Hudson Strait.

A responder marine radio beacon was established on Grappling Island at the approach to Hamilton Inlet for the Goose Bay trade.

Plans for 1965

Improvements will be made to the existing navigation light at the west end of Charles Island and all navigation lights will be operated during the shipping season.

Additional marine radio beacons will be installed on the north end of Mansel Island and at Ashe Inlet on the north side of Hudson Strait.

Several equipment failures were encountered during the season of 1964 which made the responder marine radio beacons inoperative for the latter part of the season. The transmitters will be completely overhauled and re-installed at the opening of the 1965 shipping season to Churchill.

The number of buoys and beacons in the Athabasca-Mackenzie area will be increased, and patrols for maintenance and checking of aids will be more frequent. Six sets of ranges will be fitted with lights, and single markers will be converted to ranges.

UNEMPLOYMENT INSURANCE COMMISSION

Responsibilities Administration of the Unemployment Insurance Act, including operation of an employment service in the Yukon Territory through the Commission's office at Whitehorse.

Long-term Plans

Normal planning to meet responsibilities.

Review of 1964 Operations

Through the Whitehorse office, 1,316 placements in employment were made. Of these 1,212 were of workers within the area and 104 were of workers transferred from other areas.

A co-operative arrangement was made with the Department of Northern Affairs and National Resources to improve and extend the employment service provided to residents of the Mackenzie District. The arrangement became effective late in the year and involves the co-operation of selection and placement officers of the Department of Northern Affairs and National Resources at Fort Smith, Yellowknife and Inuvik with the Edmonton office of the National Employment Service. It is designed to assist in the placement in employment of residents of the N.W.T. who desired employment outside the Territories or with contractors moving into the Territories.

The Whitehorse office handled 1,946 claims for unemployment insurance benefits and disbursed a total of \$337,600.50. This included claims handled by agents acting on behalf of the Commission at Dawson (89 claims). In the Northwest Territories, agents operated at Hay River (72 claims) and Inuvik (4 claims).

Plans for 1965

The normal operation of the National Employment Service and of the Unemployment Insurance Service will be continued.

TREASURY OFFICE

NORTHERN AFFAIRS AND NATIONAL RESOURCES

Revenue and Expenditures in the Northwest Territories

and the Yukon Territory

Fiscal Year 1963-64

<u>Department</u>	<u>Northwest Territories</u>		<u>Yukon Territory</u>	
	<u>Revenues</u>	<u>Expenditures</u>	<u>Revenues</u>	<u>Expenditures</u>
Agriculture	5, 240.56	69, 595.27	13, 895.71	171, 293.51
Chief Electoral Officer		57, 127.00	200.00	13, 786.00
Citizenship and Immigration		1, 653.00		18, 010.00
Defence Production				718.16
Indian Affairs	15, 186.65	822, 900.55	6, 183.10	974, 070.82
Finance		2, 569, 543.37		2, 158, 159.80
Fisheries	6, 295.14	214, 040.64	11, 690.00	24, 266.03
Justice	20, 784.90	163, 406.55	13, 546.24	162, 751.02
Labour		37, 279.63		195, 715.44
Mines and Technical Surveys	433.60	728, 967.95	2, 761.98	355, 060.44
National Defence		1, 587, 817.00		6, 398, 591.00
National Health and Welfare	559, 635.71	5, 993, 588.99	646, 979.24	2, 254, 544.38
National Revenue			3, 433, 105.42	211, 280.30

<u>Department</u>	<u>Northwest Territories</u>		<u>Yukon Territory</u>	
	<u>Revenue</u>	<u>Expenditures</u>	<u>Revenues</u>	<u>Expenditures</u>
Northern Affairs and National Resources	2,000,911.73	19,183,009.68	881,747.21	5,254,187.42
Northern Canada Power Commission	3,079,634.00	5,404,494.00	1,003,533.00	174,468.00
Post Office	131,104.77	822,381.34	166,335.63	785,517.53
Public Works	152,775.00	1,983,766.00	82,388.00	240,333.00
Royal Canadian Mounted Police	734,862.28	1,571,752.37	306,410.95	649,007.32
Veterans Affairs		890.00		24,572.00
Trade and Commerce	1,169.40	819.23	2,816.35	2,370.94
Transport	696,837.22	6,766,815.47	119,683.38	1,837,287.98
Unemployment Insurance Commission				50,338.37
	<u>\$7,404,870.96</u>	<u>\$47,979,848.04</u>	<u>\$6,691,276.21</u>	<u>\$21,956,329.46</u>

APPENDIX "B"

GOVERNMENT EMPLOYEES IN THE NORTHWEST TERRITORIES

DEPARTMENT OR AGENCY	NUMBER OF EMPLOYEES			
	Full Time	Seas- onal	Part Time	Total
Agriculture	22	11	9	42
Canadian Broadcasting	27	-	9	36
Citizenship & Immigration				
Immigration	1	-	-	1
Indian Affairs	67	-	-	67
Total	<u>68</u>	<u>-</u>	<u>-</u>	<u>68</u>
Crown Assets Disp. Corp.	-	-	3	3
Eldorado Mining	5	5	-	10
Fisheries				
Conservation, Development & Inspection Services	15	7	1	23
Fisheries Research Board	2	24	3	29
Total	<u>17</u>	<u>31</u>	<u>4</u>	<u>52</u>
Forestry	-	7	4	11
Justice	16	-	-	16
Mines and Technical Surveys				
Geographical Branch	-	25	-	25
Geological Survey	4	107	-	111
Marine Sciences	-	38	-	38
Mines Branch	-	-	-	-
Observatories Branch	7	15	-	22
Polar Continental Shelf Project	-	58	20	78
Surveys and Mapping Branch	-	49	12	61
Total	<u>11</u>	<u>292</u>	<u>32</u>	<u>335</u>
National Defence				
Navy	164	-	-	164
Army	145	63	-	208
Air Force	338	-	-	338
Defence Research Board	1	-	-	1
Total	<u>648</u>	<u>63</u>	<u>-</u>	<u>711</u>
National Health and Welfare	335	-	-	335
National Museum	-	6	2	8
National Research Council	3	6	9	18
National Revenue				
Customs and Excise	13	1	1	15
Taxation	6	-	-	6
Total	<u>19</u>	<u>1</u>	<u>1</u>	<u>21</u>

AND THE YUKON TERRITORY

LOCATION OF FULL-TIME EMPLOYEES

Q.E. Isl.	Northwest Territories		Mack- enzie	Yukon	TOTAL	REMARKS
	Rest of Frankl.	Kee- watin				
-	-	-	7	15	22	
-	4	-	13	10	27	
-	-	-	-	1	1	
-	-	-	31	36	67	
-	-	-	31	37	68	
-	-	-	-	-	-	
-	-	-	5	-	5	
-	-	-	13	2	15	
-	-	-	2	-	2	
-	-	-	15	2	17	
-	-	-	-	-	-	
-	-	-	6	10	16	
-	-	-	-	-	-	
-	-	-	2	2	4	
-	-	-	-	-	-	
-	-	-	-	-	-	
3	-	1	3	-	7	
-	-	-	-	-	-	
-	-	-	-	-	-	
3	-	1	5	2	11	
20	22	-	122	-	164	
102	-	-	-	43*	145	*Plus 417 before Apr. 1
-	15	-	5	318**	338	**Includes 67 civilians
1	-	-	-	-	1	
123	37	-	127	361	648	
-	50	15	151	119	335	
-	-	-	-	-	-	
2	-	1	-	-	3	
-	-	-	-	13	13	
-	-	-	-	6	6	
-	-	-	-	19	19	

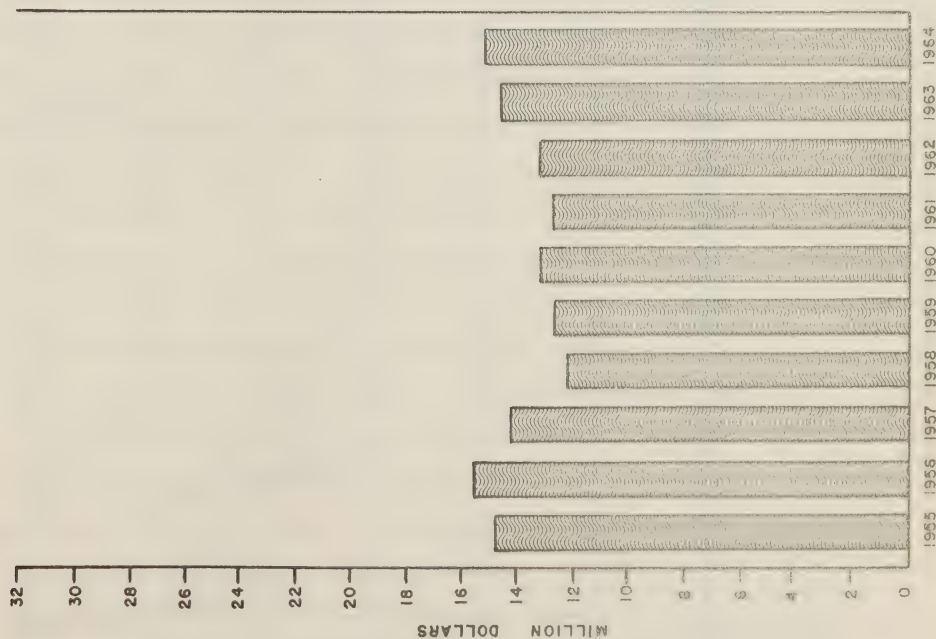
DEPARTMENT OR AGENCY	<u>NUMBER OF EMPLOYEES</u>			
	Full Time	Seas- onal	Part Time	TOTAL
<u>Northern Affairs and Nat. Resources</u>				
Canadian Wildlife Service	5	5	4	14
<u>Northern Admin. Branch</u>				
Administrator of the Arctic	352	-	-	352
Administrator of the Mackenzie	527	60	231	818
Commissioner of the Yukon	51	11	21	83
Total for N. A. Branch	<u>930</u>	<u>71</u>	<u>252</u>	<u>1253</u>
Northern Co-ordination and Research Centre	3	16	-	19
Total for N. A. N. R.	<u>938</u>	<u>92</u>	<u>256</u>	<u>1286</u>
Northern Canada Power Commission	117	-	37	154
Northern Transportation Company	3	329	42	374
Post Office	70	-	8	78
Public Works	465	1066	96	1627
R. C. M. Police	179	-	-	179
<u>Transport</u>				
Air Services	530	41	220	791
Marine Services	3	1278	-	1281
Total	<u>533</u>	<u>1319</u>	<u>220</u>	<u>2072</u>
Unemployment Insurance Commission	9	-	1	10
Grand Total, 1964	3485	3228	733	7446
Grand Total, 1963	3889	1325	1777	6991
Difference	-404	+1903	-1044	+455

LOCATION OF FULL-TIME EMPLOYEES

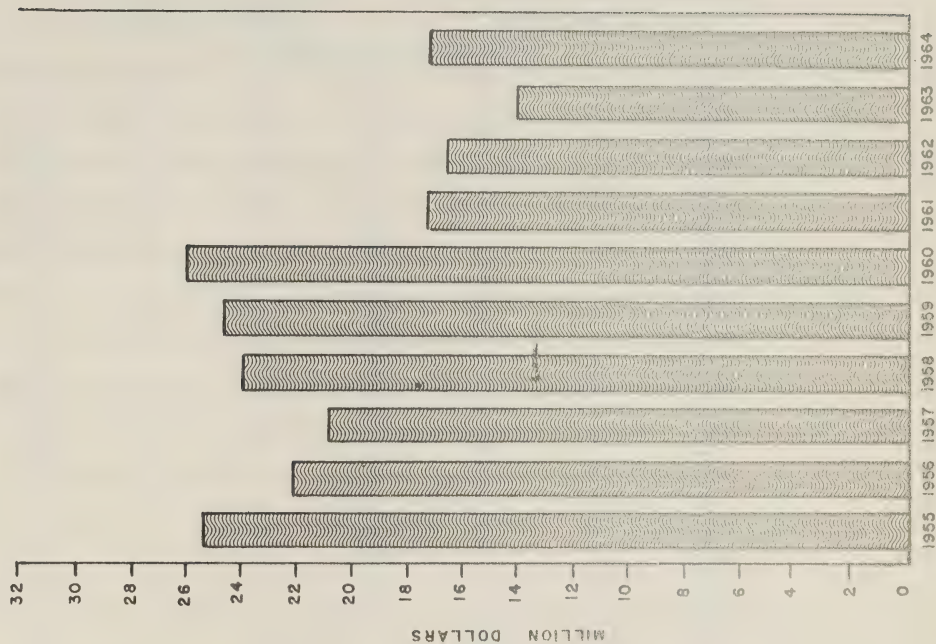
Q. E. Isl.	Northwest Territories		Mack- enzie	Yukon	TOTAL	REMARKS
	Rest of Frankl.	Kee- watin				
-	-	-	4	1	5	
6	194	152	-	-	352	Does not include 117 in Arctic Quebec. Keewatin figure includes 70 at Regional HQ, Churchill.
-	16	2	509	-	527	
-	-	-	-	51	51	
<u>6</u>	<u>210</u>	<u>154</u>	<u>509</u>	<u>51</u>	<u>930</u>	
-	-	-	3	-	3	
<u>6</u>	<u>210</u>	<u>154</u>	<u>516</u>	<u>52</u>	<u>938</u>	
-	20	-	83	14	117	
-	-	-	3	-	3	
-	2	5	25	38	70	
-	-	-	24	441	465	
5	31	13	77	53	179	
62	122	71	157	118	530	
-	-	-	3	-	3	
<u>62</u>	<u>122</u>	<u>71</u>	<u>160</u>	<u>118</u>	<u>533</u>	
-	-	-	-	9	9	
201	476	260	1248	1300	3485	Yearly differences in seasonal and part time figures due partly to classification difficulties. Data were unavailable on some part time workers.
178	452	166	1230	1863	3889	
<u>+23</u>	<u>+24</u>	<u>+94</u>	<u>+18</u>	<u>-563</u>	<u>-404</u>	

TOTAL VALUE OF MINERAL PRODUCTION

YUKON TERRITORY



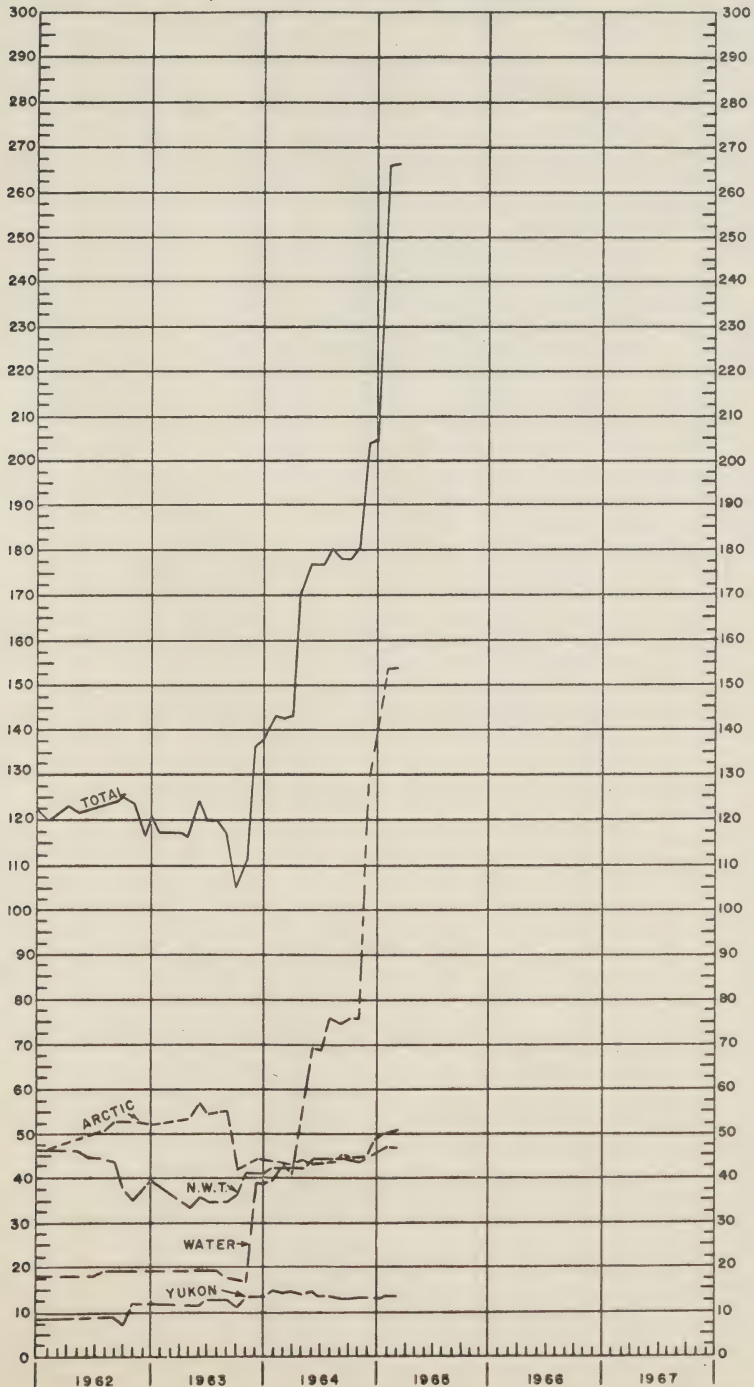
NORTHWEST TERRITORIES



ACREAGE HELD UNDER OIL & GAS PERMIT (CANADA LANDS)

APPENDIX "D"

--- ACTIVE PERMITS (Northwest Territories) --- ACTIVE PERMITS (Yukon Territory)
 --- ACTIVE PERMITS (Arctic Islands) --- ACTIVE WATER PERMITS
 --- NET TOTAL (EXCLUDING RESERVATIONS)



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